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ABSTRACT

This Charleston Burn Study was designed to determine the prevalence of the burn risks in the public school population in Charleston, South Carolina. Twelve schools representing a cross section of urban, suburban, rural and military populations participated in the project. Students completed forms that revealed their experience with burns and knowledge of safety and burn treatment. Validation of student responses was conducted by school nurses who attempted to determine the percentage of children accurately reporting burn exposure and experience. Data were complied in four race-sex groups (black males, black females, white males, white females) and two grade groups (K-4, 5-8). The correct validation proportions between the four race-sex and two grade groups were different. The proportion of correct validation was larger for nurses who knew the students' self-reported burn status at the time of validation. Most burns in the general school population were treated at home. The proportion of correct answers for the questions regarding emergency management of burns was different between groups. The analysis showed a serious underreporting of burn exposure and burn experience for black males. (Author/APM)

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A PREVALENCE STUDY OF THE RISK OF BURNS IN THE PUBLIC SCHOOL POPULATION IN CHARLESTON, SOUTH CAROLINA

by

Charlyne Butler Littlefield

A Research Project submitted to the faculty of the Medical University of South Carolina in partial fulfillment of the requirements for the degree of Master in Health Sciences in the College of Allied Health Sciences.

Masters in Health Sciences Program

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CHARLYNE BUTLER LITTLEFIELD. A Prevalence Study of the Risk of Burns in the Public School Population in Charleston, South Carolina. (Under the direction of Dr. Stanley Schuman.)

The Charleston Burn Study was designed to determine the prevalence of the risks of burns in the public school population in Charleston, South Carolina. An epidemiologist, a physical therapist, a health educator, a representative from Consumer Product Safety Commission, local firemen, and other interested volunteers comprised the staff for the study.

A written proposal including a preliminary burn survey form, a brief description of the study, its purpose, and the criteria for the teachers and students was submitted to the Charleston County School Board for approval. A pilot study was conducted in two elementary schools. Revision of the burn survey form was completed using suggestions from teachers. Twelve schools representing a cross-section of urban, suburban, rural and military populations participated in the actual burn project.

The survey forms, designed to obtain handwritten narratives of burn or no burn experience, safety facts, and actual burn knowledge were distributed by the teacher. Each student completed the form with teacher supervision. Time needed to complete the survey form varied with grade level, reading ability, and extent of burn experience.

Validation of student answers was conducted by the school nurse. Four school nurses received computer generated lists reporting the burn status of the student. Eight school nurses received lists which did not include the burn status of the student. Validation attempted to determine the percentage of children accurately reporting their burn

exposure and experience.

Of 6,736 survey forms distributed, 5,825 forms were returned. This represented an 86.5% reponse rate. Validation of 832 student responses was completed (approximately 14.3%).

Data were analyzed for four race (black/white) and sex (male/female) groups and two grade groups (K-4, 5-8). The correct validation proportions between the four race-sex and the two grade groups were different. The proportion of correct validation was larger for nurses who knew the students' self-reported burn status at the time of validation. Most burns in this general school population were treated at home. The proportion of correct answers for the section of three quiz questions regarding emergency management of burns was different. The analysis revealed a serious under-reporting of burn exposure and experience for black males.

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GLOSSARY OF TERMS

1. Rate: The number of cases of disease present in the population at a specified time divided by the number of persons in the population at that specified time multiplied by 1000.

2. Sampling ratio: The number sampled divided by the number at risk of being sampled multipled by 100 and therefore expressed as a percent.

3. Scar: A permanent mark left in the skin by the healing of burned tissue.

4. Special education: Classes for children who require more individualized instruction than routinely provided for public school children due to emotional, physical, or learning disabilities.

5. Severity index: The number of burns and scars divided by the number of scars then multipled by 100 and expressed as a percent.

6. Validation: The process of verifying the information written on self-reporting survey forms by individual interview.

THE PROBLEM AND REVIEW OF LITERATURE

The United States leads all major industrialized nations in per capita deaths and property loss due to fire with a rate nearly twice that of the second highest, Canada.[1] Deaths and crippling due to burns in this country are greater than the mortality and morbidity due to poliomyelitis in the peak epidemic year of 1954.[2] Due to the sensitivity of the skin of young children, they are at special risk from burns. A serious burn is the most severe trauma a child can survive. A child who does survive can be hospitalized for months, will probably need reconstructive surgery for years after that, and will bear the scars for a lifetime.

Epidemiology has been traditionally associated with identification and control of infectious diseases, but these same strategies can be used to study burn risk, prevalence and knowledge. For example, analysis of circumstances surrounding burn "accidents" reveal nonrandomness and predictability. The etiology of burn injuries is age and race specific and is correlated with other demographic factors. Burns do not occur by "chance" alone.[3] This study's purpose was to determine if burns are a problem in the Charleston school population, and, if so, how do these burns distribute themselves? It was desired to accomplish this with a survey of the school population, instead of a select population as in hospital or emergency room studies. In addition to obtaining information to describe the population at risk,

TABLE 1.--Comparison of Survey Results with Other Studies

Burn Cause in Rank Order	Charleston Burn Project	M.U.S.C. Hospital Tri-County Residents	M.U.S.C. Hospital Statewide	Boston Project Burn Prevention	New York Hospital Survey	Neiss National Consumer Product Safety Commission
AGE:	4-16	4-16	4-16	4-12	All ages	5-14
NUMBER:	5,825	40	55	2,729	2,852	119 Hospitals
METHOD:	Self-Report	Chart Review	Chart Review	Chart Review	Chart Review	E.R. Surveillance
ONE	Cooking	Cooking	Open Fire	Scalds	Scalds	Sun lamps
TWO	Irons	House Fire, Scalds, Open Fire	House Fire	House Fire	Clothing	Liquid Fuels
THREE	Scalds	Gasoline	Gasoline	Matches and Stove [a]	Gasoline	Heaters
FOUR	Open Fire	Gunpowder, Kerosene and Abuse	Scalds, Clothing	Open Fire	Chemicals	Fireworks
FIVE	Heaters		Cooking, Heaters Automobiles		Cooking	Open Flame
SIX	Misc.				Stoves	Irons
SEVEN	Cigarettes				Conflagrations	Electrical
EIGHT	Auto, Mowers, etc.				Electrical	Cigarettes
NINE	Firecrackers				Automobile	
TEN	Housefire					
TIME PERIOD	"ever"	Admission 1971-1980	Admission 1971-1980	Inpts. and Outpts. 1973-1976	Admission 1974	1978

a. Stove = Cooking
b. Gasoline = Liquid fuel

safety engineering works to improve product safety and fire warning mechanisms. Burn prevention is the only method of controlling the incidence of burns.

HYPOTHESES

The hypotheses that were tested and their alternatives are listed below.

1. H_0: The self-reported proportion of burns for white males, black males, white females and black females is the same.

H_0: $P_{wm} = P_{bm} = P_{wf} = P_{bf}$

H_1: $P_{wm} \neq P_{bm} \neq P_{wf} \neq P_{bf}$

2. H_0: The proportion of correct validations for grade groups K-4 and 5-8 is the same.

H_0: $P_{K-4} = P_{5-8}$

H_1: $P_{K-4} \neq P_{5-8}$

3. H_0: The proportion of correct validations for white males, black males, white females, and black females is the same.

H_0: $P_{wm} = P_{bm} = P_{wf} = P_{bf}$

H_1: $P_{wm} \neq P_{bm} \neq P_{wf} \neq P_{bf}$

4. H_0: The proportion of correct validations for nurses with known burn status and nurses with unknown burn status is the same.

H_0: $P_{known} = P_{unknown}$

H_1: $P_{known} \neq P_{unknown}$

5. H_0: Burn cause groups for white males, black males, white females, and black females are the same.

H_0: $P_{wm} = P_{bm} = P_{wf} = P_{bf}$

H_1: $P_{wm} \neq P_{bm} \neq P_{wf} \neq P_{bf}$

6. H_0: Burns treated at home, E.R./Hospital, Doctor's Office, and other places are the same.

H_0: $P_{Home} = P_{E.R./Hospital} = P_{Doctor's\ Office} = P_{Other}$

H_1: $P_{Home} \neq P_{E.R./Hospital} \neq P_{Doctor's\ Office} \neq P_{Other}$

7. H_0: The proportion of correct answers for three quiz questions for white males, black males, white females, black females is the same.

H_0: $P_{wm} = P_{bm} = P_{wf} = P_{bf}$

H_1: $P_{wm} \neq P_{bm} \neq P_{wf} \neq P_{bf}$

METHODS

The surveyed population (N=6,736) represented approximately fourteen percent of the Charleston County public school enrollment of 88,000. Twelve middle and elementary schools were involved in the survey. This was an opportunistic, cross-sectional sample, not chosen by a random list. In the Charleston County Public School System, there are sixty middle and elementary schools, consisting of twenty-nine suburban, fifteen urban, thirteen rural and three military. (See Table 2). This survey involved three suburban, four urban, four rural, and one military school which was also suburban. The estimated sampling ratios were determined for each location. The sampling ratios were 10.34 percent suburban, 26.67 percent urban, 30.76 percent rural, and 33.33 percent military. If the military school is calculated as a suburban school, the sampling ratio for suburban schools becomes 13.79 percent.

No complete sampling frame was available from the School Board from which to draw a probability or random sample; therefore, the schools were chosen by the Charleston County Health Education Coordinator. The characteristic for stratifying for the best sample was not known; therefore, certain demographic characteristics were chosen as logically useful. In addition, financial resources were limited and this mandated much of the project's methodology.

This survey was designed after the United States Consumer Product Safety Commission reported findings of a hospital based study completed in Boston Massachusetts. This study was aimed at a community based sample of school children. The project staff for this survey consisted of an epidemiologist, a physical therapist, a health educator, a representative from the Consumer Product Safety Commission and local firemen along with other interested volunteers.

A written proposal was submitted to the Charleston County School Board for approval. The proposal included a preliminary burn survey form, and a brief description of the study, its purpose, and criteria for teachers and students. This proposal was approved in March, 1980. (See Appendix A.)

Data were collected by using a self-reporting burn survey. The survey instrument was designed by the project staff. Since the Office of Educational Services had previous experience in designing and utilizing questionnaires, their assistance was obtained for the survey format. The project staff realized that a survey was only as good as its format. A pilot study was performed using two elementary schools; one primarily white and suburban, and the other black and rural. Difficulties with the questionnaires were found, and the necessary revisions were made. Suggestions from teachers were also considered. The original questionnaire was confusing to the children because of a flame emblem which was placed in the center of the space provided for the burn narrative and also because of the wording of several questions. Once the final survey form was designed, the health educator and the representative for the United States Consumer Product Safety Commission assumed the responsibility for providing the

Program, Medical University of South Carolina. From the completed data sheets, punch cards were made and the computer programmed to generate a list of every fourth name for the validation study for four schools. Manual lists were generated from the data sheets for the remaining eight schools. For these manual lists, every fourth child classified by self-report as a scar was listed first, then the self-reported burns, and finally the self-reported no burns. This weighted the validation toward children with burn incidence and resulted in a stratified unequal proportionate sampling (See Table 3). Once the lists were completed, a meeting with the school nurses was coordinated by the Charleston County Health Education Coordinator. Each nurse was provided with a list of students for validation in addition to written instructions on how to conduct the validation. By chance, the four nurses with computer generated lists had prior knowledge of the child's self-reported burn status, and the eight nurses with manual lists did not.

The list of students for the validation was a relatively systematic sample of every fourth name on the data sheet or punch cards. The entries on the data sheet were not coded in any particular order. If the list resulted in more than eighty-five students, the nurse was instructed to limit the validations to eighty-five. This number was determined by the nurses to be a feasible study to fit into their schedule of normal activities. In addition to the student's name, their teacher and grade were included so the nurses could easily locate the students. The nurses actually interviewed each child individually. First, she asked each child if they had ever been burned, and if so, what caused the burn?

TABLE 3.--List of Schools by Type of Validation List

Computer	Manual
Stiles Point Elementary	James Simmons Elementary
Haut Gap Middle	North Charleston Elementary
Schroeder Middle	Baxter Patrick Elementary
Wallace Middle	Springfield Elementary
	Rhett Middle
	Lincoln Middle
	Memminger Elementary
	Hunley Park Elementary

If the child has been burned, the nurse then asked to see the burn and then documented its location. Even if the nurse had a computerized list of students, and therefore knew the self-reported burn status, she did not know burn cause or location. The school nurses were chosen for the validation because of their access to school children. If an outside individual performed the validation, parental consent would have to be obtained before the children could be examined; furthermore, if child abuse in the home is contributing to burn injuries, the parental consent would be difficult to obtain.

In addition to the student's name, school, grade, teacher, and burn status, which was needed for the validation list, the child's sex, age and race were also coded on the data sheet by numbers assigned to each answer possibility. A pilot project of coding the sheets with the two elementary schools resulted in a team effort to agree on principles and guidelines for the coding. Each burn narrative was judged by the author for its clarity and was determined to be either satisfactory, unsatisfactory, or not known. Some children had such poor writing ability, erasures, and spelling that their burn narrative could not be considered acceptable. Other children stated they had been burned, but did not complete a narrative. For those children that had been burned and produced a satisfactory burn narrative, the cause of their burn was assigned a number and coded. The specific burn causes used on the code key were the causes reported from the narratives of the pilot study. The specific burn causes were grouped in twelve categories for simplicity of reporting. Place of treatment, presence of home fire, a smoke detector, and escape plan were coded

along with the answers to the quiz questions on emergency management of burns. The answer to the question regarding another burn was coded as either yes, no, or do not know if left unanswered. The same codes were used to record burn status, specific burn cause, and grouped burn cause from the nurse's validation. Body area burned was coded for the validation study only. If a child was not burned, the coding of the quality of burn narrative, the burn cause, and place of treatment was deleted. An important factor in this study is the fact that the majority of the forms were coded by the author; the advantage of this is in the direction of consistency; the disadvantage is that a bias could have been reduced by a "jury" or "panel" of coders. This was not possible in this study.

ANALYSIS

The computer programming and statistical analysis was performed by the Biometry Department, Medical University of South Carolina. All data generated in this study were nominal data that required a statistical test for simple counts; therefore, a chi-square test was used ($p < .05$). An outline was used to prepare the burn project analysis (See Appendix C). More than sixty tables were generated, but only a selection of these were used in the final analysis (See Appendix D). Many of the tables simply require close scrutiny of the frequency counts and do not demand statistical testing although seven hypotheses were tested using the chi-square test of association.

RESULTS

Of 6,736 survey forms distributed, 5,825 forms were returned. This represented an 86.5 percent response rate. Validation of 832 student responses were completed. This represented 14.3 percent of the survey population that completed their survey forms which approximates the ten percent minimum that would be desirable. For grades K-4, 2,775 surveys were returned. For grades 5-8, 2,951 surveys were returned. Due to the small number of special education classes, only eighty-one surveys were returned from this group; therefore, they are not analyzed equally with the other two grade groups, K-4 and 5-8. This was an opportunistic add-on feature; our preventative motives stimulated a quick look at this special group which might be at special risk of burning. A separate study with larger numbers would be required. The data from the special education classes were not deleted from the tables, but were not used in the analysis (See Table 4).

Table 5 shows the frequencies of self-reported burn status by validated burn status for two grade groups (See Table 5). The difference in percent agreement for scars between grades K-4 and grades 5-8 is 38.3 percent. These percentages are 24.6 and 62.9 respectively. This difference indicates the younger children were confused about the question of residual scarring. From the burn narratives, it was noted that this grade group wrote about blisters that lasted several weeks and gradually disappeared. This is not the same as a permanent

Table 4.--Table of Population at Risk and Participating

Original population	6736
Participating population	5825
Survey response rate	86.5%
No unsatisfactory forms	154
Satisfactory forms	5671
No burns reported	1883
Burns and scars	3788
Scars	2044

TABLE 5.--Frequencies of Self-reported Burn Status by Validated Burn Status for Two Grade Groups

Self-Report	Grade Group	Validated Burn Status			Total	Percent
		Scar	Burn	No Burn		
Scar	K-4	34	74	30	138	34.0
	5-8	124	41	32	197	46.2
Burn	K-4	6	90	37	133	32.8
	5-8	24	75	18	117	27.5
No Burn	K-4	10	17	108	135	33.2
	5-8	10	13	89	112	26.3
Total	K-4	50	181	175	406	100.0
	5-8	158	129	139	426	100.0
Percent	K-4	12.3	44.6	43.1	100.0	
	5-8	37.0	30.3	32.6	100.0	

TABLE 11.--Frequencies of Self-reported Burn Status by Validated Burn Status for Schools With Student's Burn Status Not Listed for Nurse

Self-Report	Grade Group	Validated Burn Status			Total	Percent
		Scar	Burn	No Burn		
Scar	K-4	31	66	25	122	36.3
	5-8	48	19	23	90	49.0
Burn	K-4	6	70	29	105	31.3
	5-8	7	24	12	43	23.4
No Burn	K-4	10	14	85	109	32.4
	5-8	2	6	43	51	27.7
Total	K-4	47	150	139	336	100.0
	5-8	57	49	78	184	100.0
Percent	K-4	14.0	44.6	41.4	100.0	
	5-8	31.0	26.6	42.4	100.0	

TABLE 12.--Comparison of Nurses with Known Burn Status and Nurses with Unknown Burn Status

Nurse-Child Agreement	Grade Group	School Nurse-Evaluator		
		(a) Known Status	(b) Unknown Status	= a-b Difference
Agreement on burn status	K-4	65.7%	55.4%	+10.3%
	5-8	71.6%	62.5%	+09.1%
Overreporting by child	K-4	30.0%	35.7%	- 5.7%
	5-8	14.0%	29.4%	-15.4%
Under-reporting by child	K-4	4.3%	8.9%	- 4.6%
	5-8	9.8%	8.2%	+ 1.6%

scar. Due to the overreporting by the younger children, most tables list scars and burns together for grades K-4 since only one out of every four scars reported in this group are valid.

The first hypothesis states that the self-reported proportion of burns for the four race-sex groups is the same. This hypothesis is rejected at the $p < .05$ level of significance. The calculated chi-square value (3d.f.) equals 22.9143 and the tabulated chi-square value (3 d.f.) equals 9.488. Of the four race-sex groups, black females report the most burns. Black males follow the black females, and then white males and females.

For grade groups K-4 and 5-8, the second hypothesis states the proportion of children accurately reporting their burn status is the same. (See Table 5.) The calculated chi-square (one degree of freedom) equals 9.709. The chi-square test statistic (one degree of freedom) equals 3.84 ($p < .05$). It can be concluded that the data does not support this null hypothesis and the older age group had a higher percentage of burns validated by the school nures.

The third and fourth hypotheses are also involved with the validation study. The third hypothesis states the proportion of white males, black males, white females, and black females accurately reporting their burn status is the same. (See Tables 6, 7, 8, and 9.) The calculated chi-square (3 d.f.) equals 1.5325. The chi-square test statistic (3 d.f.) equals 7.81 ($p < .05$). The hypothesis is not rejected and it can be concluded that there is no difference in the proportion of validations for the four race-sex groups. Even though the proportions of correct validations are not significantly different, black males had the highest proportion and were followed closely by black

TABLE 6.--Frequencies of Self-reported Burn Status by Validated Burn Status for White Males and Two Grade Groups

Self-Report	Grade Group	Validated Burn Status			Total	Percent
		Scar	Burn	No Burn		
Scar	K-4	6	23	3	32	30.4
	5-8	9	8	2	19	38.0
Burn	K-4	2	32	8	42	40.0
	5-8	4	18	1	23	46.0
No Burn	K-4	3	3	25	31	29.5
	5-8	0	4	4	8	16.0
Total	K-4	11	58	36	105	100.0
	5-8	13	30	7	50	100.0
Percent	K-4	10.5	55.2	34.3	100.0	
	5-8	26.0	60.0	14.0	100.0	

TABLE 7.--Frequencies of Self-reported Burn Status by Validated Burn Status for Black Males and Two Grade Groups

Self Report	Grade Group	Validated Burn Status			Total	Percent
		Scar	Burn	No Burn		
Scar	K-4	8	12	8	28	37.3
	5-8	35	12	14	61	43.0
Burn	K-4	1	13	3	17	22.7
	5-8	7	22	5	34	23.9
No Burn	K-4	1	4	25	30	40.0
	5-8	3	3	41	47	33.1
Total	K-4	10	29	36	75	100.0
	5-8	45	37	60	142	100.0
Percent	K-4	13.3	38.7	48.0	100.0	
	5-8	31.7	26.1	42.2	100.0	

TABLE 8.--Frequencies of Self-reported Burn Status by Validated Burn Status for White Females and Two Grade Groups

Self-Report	Grade Group	Validated Burn Status			Total	Percent
		Scar	Burn	No Burn		
Scar	K-4	4	16	3	23	22.3
	5-8	7	7	1	15	31.2
Burn	K-4	0	28	15	43	41.7
	5-8	4	20	2	26	54.1
No Burn	K-4	2	5	30	37	35.9
	5-8	6	3	4	7	14.5
Total	K-4	6	49	48	103	100.0
	5-8	11	30	7	48	100.0
Percent	K-4	5.8	47.5	46.6	100.0	
	5-8	22.9	62.5	14.6	100.0	

TABLE 9.--Frequencies of Self-reported Burn Status by Validated Burn Status for Black Females and Two Grade Groups

Self-Report	Grade Group	Validated Burn Status			Total	Percent
		Scar	Burn	No Burn		
Scar	K-4	12	14	12	38	44.7
	5-8	66	12	15	93	58.1
Burn	K-4	3	11	9	23	27.0
	5-8	4	14	7	25	15.6
No Burn	K-4	2	2	20	24	28.2
	5-8	7	3	32	42	26.2
Total	K-4	17	27	41	85	100.0
	5-8	77	29	54	60	100.0
Percent	K-4	20	31.7	48.2	100.0	
	5-8	48.1	18.1	33.8	100.0	

females, then white females and white males. The fourth hypothesis asks whether the nurses with known burn status had a higher proportion of students who accurately reported their burn status than did the nurses with unknown burn status. The calculated chi-square (1 d.f.) equals 11.8330. The chi-square test statistic (1 d.f.) equals 3.84 ($p < .05$). The null hypothesis is rejected, and it can be concluded that there is a difference in the proportion of validations between nurses with known and unknown burn status. The nurses with known burn status have a higher percentage of validations. (See Tables 10 and 11). For grades K-4, the nurses with known burn status show 10.3 percent higher agreement between the self-reported burn status and the nurse's validation. For grades 5-8, the nurses with known burn status report 9.1 percent higher agreement. (See Table 12.)

The fifth null hypothesis asks whether burn cause groups for white males, black males, white females, and black females are the same. (See Table 13.) For household causes, the calculated chi-square (9 d.f.) equals 401.14607. The chi-square test statistic (9 d.f.) equals 23.59 ($p < .005$). Therefore, the null hypothesis for household causes is rejected and it can be concluded that burn causes for the four race-sex groups are different for household causes. For outdoor causes, the overall chi-square was not significant. The null hypothesis for outdoor is not rejected since the calculated chi-square (6 d.f.) equals 11.36933, and the chi-square test statistic (6 d.f.) equals 12.59 ($p < .05$). It can be concluded that burn cause groups for the four race-sex groups are the same for outdoor causes. Since the calculated chi-square value is close to the tabulated value, it can be stated that the major deviations from the expected are

TABLE 10.--Frequencies of Self-reported Burn status by Validated Burn Status for Schools with Student's Burn Status Listed for Nurse.

Self-Report	Grade Group	Validated Burn Status			Total	Percent
		Scar	Burn	No Burn		
Scar	K-4	3	8	5	16	22.8
	5-8	63	19	5	87	40.5
Burn	K-4	0	20	8	28	40.0
	5-8	17	46	6	69	32.1
No Burn	K-4	0	3	23	26	37.1
	5-8	8	6	45	59	27.4
Total	K-4	3	31	36	70	100.0
	5-8	88	71	56	215	100.0
Percent	K-4	4.3	44.2	51.4	100.0	
	5-8	40.9	33.0	26.0	100.0	

TABLE 13.--Rates per 1000 of Burn Causes, Regardless of Severity, Grouped by Race, Sex, and Grade

Burn Cause	White Male		Black Male		White Female		Black Female		Range	Mean
	K-4	5-8	K-4	5-8	K-4	5-8	K-4	5-8		
HOUSEHOLD CAUSES:	500	486	654	583	700	674	732	761	275	636
Cooking	314	319	264	204	448	428	212	200	248	298
Irons	45	31	227	160	74	98	348	305	317	161
Scalds	107	108	149	106	148	116	96	129	53	120
Heaters	32	27	105	112	27	30	75	125	98	66.6
OUTDOOR CAUSES:	247	287	105	169	116	147	70	98	217	154.8
Open Fire	187	157	81	114	83	81	63	72	124	104.7
Automobile	28	93	6	29	25	41	2	19	91	30.4
Firecracker	32	36	16	25	6	24	5	6	31	18.8
OTHER CAUSES:	86	46	84	29	93	39	68	28	65	59.1
Cigarettes	73	41	54	12	86	32	53	19	74	46.3
House Fire	10	0	6	9	7	2	13	6	13	7.0
Abuse	2	4	23	7	0	4	2	3	23	5.6
MISCELLANEOUS CAUSES*	64	105	47	27	49	96	30	25	78	55.4
DO NOT KNOW	101	73	108	189	42	42	98	87	147	110.9
DENOMINATOR	464	407	295	543	430	455	396	632		

*Includes electrical and hot metal burns, sunburn, gasoline spills, and hot plastics.

automobiles for the row marginals and black females for the column marginals. For other causes, which include cigarettes, house fires, and abuse, the null hypothesis is rejected. These causes were grouped together since they could be either household or outdoor causes. The calculated chi-square (6 d.f.) equals 26.21209. The chi-square test statistic (6 d.f.) equals 18.55. It can be concluded that burn cause groups for the four race-sex groups are different for other causes.

The sixth null hypothesis states the number of burns treated at home, emergency room/hospital, doctor's office and other places is the same (See Table 14.) The calculated chi-square (4 d.f.) equals 55.1963. The chi-square test statistic (4 d.f.) equals 14.86 ($p < .005$). It can be concluded that the number of burns treated at home, emergency room/hospital, doctor's office and other places are different.

The seventh null hypothesis states the proportion of correct answers for the quiz questions concerning burn knowledge for white males, black males, white females, and black females is the same. (See Table 15.) This hypothesis is rejected at $p < .005$ level of significance. The calculated chi-square (9 d.f.) equals 511.608. The chi-square test statistic (9 d.f.) equals 23.59. It can be concluded that the porportion of correct answers for the quiz questions concerning burn knowledge for the four race-sex groups is different. With further evaluation, if sex is fixed, the number of correct responses is independent of race. However, if one fixes race, the number of correct responses is not independent of sex; therefore, the number of correct responses is related to sex, but not to race.

TABLE 14.--Frequencies of Scars and Burns by Place of Treatment and Two Grade Groups

Burn Cause	Grade Group	Place of Treatment				Total
		Home	E.R./ Hospital	Doctor's Office	Other	
Scar and Burn	K-4	1268	99	98	35	1500
Scar	5-8	924	118	69	26	1137
Burn	5-8	734	28	90	21	803
Total	K-4	1268	99	98	35	1500
	5-8	1658	146	89	47	1940
Percent	K-4	84.5	6.6	6.5	2.3	43.6
	5-8	85.5	7.5	4.6	2.4	56.4

TABLE 15.--Frequencies of Correct Answers to Quiz Questions by Four Race-Sex Groups and Two Age Groups. Special Education Classes are Included.

Race-Sex Group	Age Group	Answers				Total	Percent
		Three Correct	Two Correct	One Correct	Zero Correct		
White Male	K-4	265	245	79	37	626	11.6
	5-8	349	451	69	29	898	16.6
Black Male	K-4	241	216	71	30	558	10.3
	5-8	311	471	40	26	848	15.7
White Female	K-4	472	155	24	7	658	12.2
	5-8	373	143	6	3	525	9.7
Black Female	K-4	503	178	23	10	714	13.2
	5-8	321	168	7	3	499	9.2
Spec. Ed.	K-4	38	23	8	12	81	1.5
Total	K-4	1481	794	197	84	2556	48.0
	5-8	1354	1233	122	61	2770	52.0
Percent	K-4	57.9	31.1	7.7	3.3	100.0	
	5-8	49.0	44.5	4.4	2.2	100.0	
TOTAL		2873	2050	327	157	5326	
PERCENT		53.1	37.9	6.0	2.9	100.0	

White females show the highest proportion of correct answers and are followed closely by black females.

It must be noted that 91.8 percent of the students responded correctly to question one, 56.7 percent responded correctly to question two, and 91.5 percent responded correctly to question three. Question two was missed most frequently. (See Figure 1.) Question two was in regards to burn care immediately after a burn occurs. This may demonstrate a void in burn education.

Even though many of the tables were not used in completing the statistical analysis, several warrant presentation here. (See Table 16.) Table 16 shows rates per 1000 children of burn causes by eight groups (race-sex-grade) and by sex totals. This compares the eight race-sex-grade groups, and from this table, it can be seen that certain conclusions can be drawn. Cooking related accidents cause most burns. More blacks report iron and heater burns than whites. White males report the highest rates for burns due to open fires, flames, and matches. White females, grades 5-8, report 93/1000 burns due to automobiles, lawnmowers, etc. Black females, grades K-4, report only 2/1000 burns due to the same cause group. More males report firecracker burns than females, although the older female age group reports more firecracker burns than the younger age group. More whites report cigarette burns than blacks. The younger black age group reports low rates for house fires except for black females, grades K-4, who report 13/1000 house fire burns. Black males, grades K-4 report 23/1000 burns due to abuse. One hundred eighty-nine per thousand black males, grades 5-8, do not narrate their burn causes, even though they report being burned. The younger age group reports more "other"

FIGURE 1.--Answers to Fire Prevention Questions 1, 2, and 3

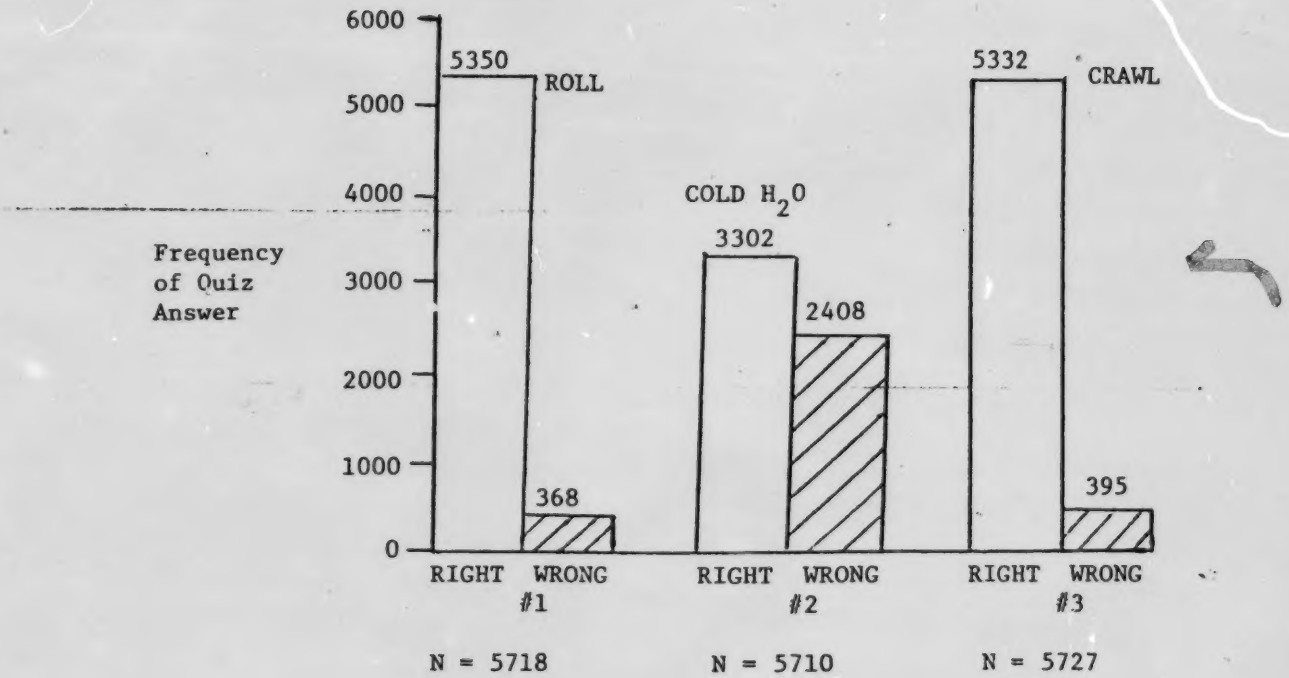


TABLE 16.--Rates Per 1000 Children of Burn Cause, Regardless of Severity, Grouped by Race, Sex, and Grade

Burn Cause	White Male		Black Male		Total Male		White Female		Black Female		Total Female		Total	
	K-4	5-8	K-4	5-8	K-4	5-8	K-4	5-8	K-4	5-8	K-4	5-8	K-4	5-8
HOUSEHOLD CAUSES:	500	486	654	583	559	542	700	674	732	761	715	725	641	639
Cooking	314	319	264	204	295	253	448	428	212	200	335	296	316	276
Irons	45	31	227	160	115	105	74	98	348	305	206	219	163	166
Scalds	207	108	149	106	88	107	148	116	96	129	123	216	107	116
Heaters	32	27	105	112	60	75	27	30	75	125	51	86	55	81
OUTDOOR CAUSES:	247	287	105	169	192	220	116	147	70	98	94	119	141	166
Open Fire	187	157	81	114	146	132	83	81	63	72	74	76	108	103
Automobile	28	93	6	29	19	56	25	41	2	19	14	29	17	42
Firecracker	32	36	16	25	26	30	6	24	5	6	6	14	16	22
OTHER CAUSES:	86	46	84	29	85	36	93	39	68	28	31	33	83	35
Cigarettes	73	41	54	12	65	25	86	32	53	19	70	25	68	25
House Fire	10	0	6	9	9	5	7	2	13	6	10	5	9	5
Abuse	2	4	23	7	10	6	0	4	2	3	1	4	6	5
MISCELLANEOUS CAUSES*:	64	105	47	27	57	61	49	96	30	25	40	55	48	58
DO NOT KNOW	101	73	108	189	104	140	42	42	98	87	69	68	86	102
DENOMINATOR	464	407	295	543	759	950	430	455	396	632	826	1087	1585	2037

*Includes electrical and hot metal burns, sunburn, gasoline spills, and hot plastics.

causes. White males and females, grades 5-8, report the largest number of burns due to miscellaneous causes.

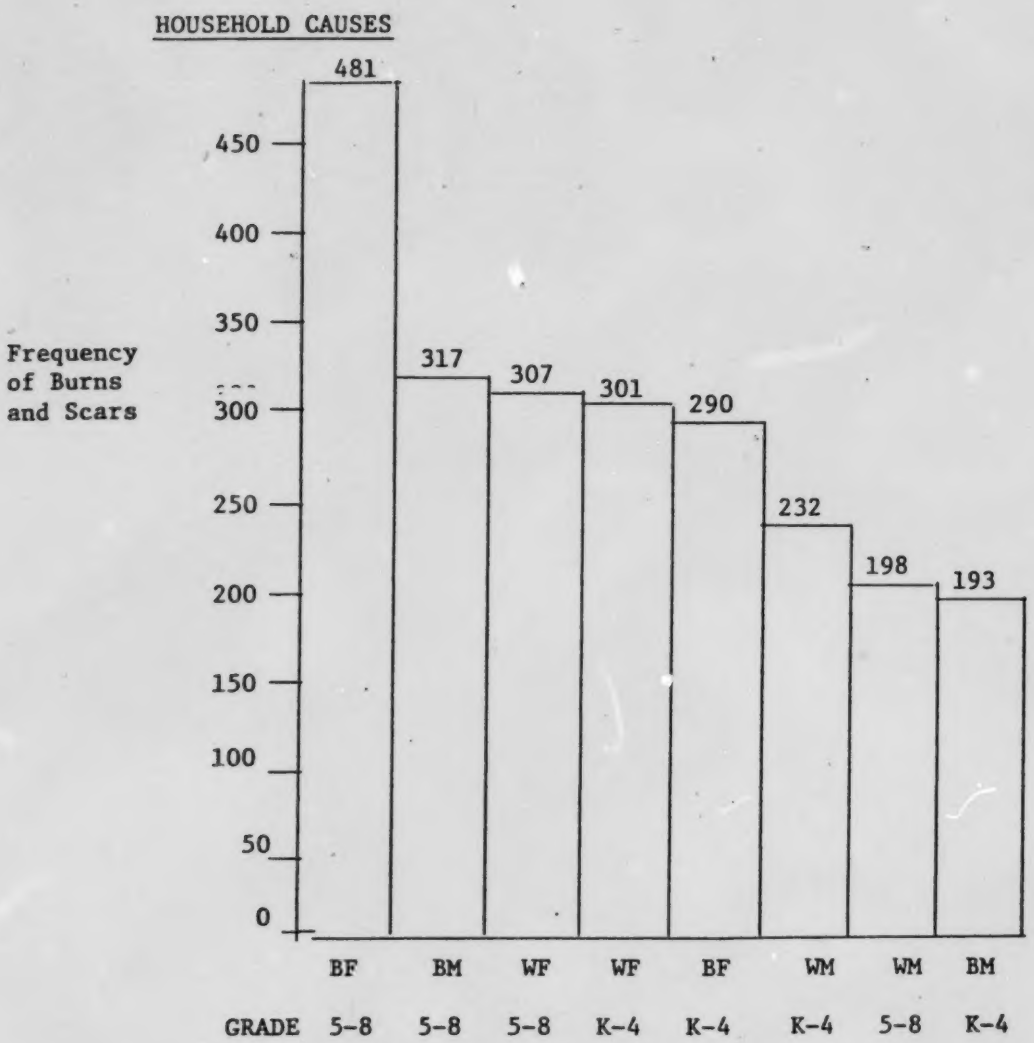
Raw numbers are used in Figures 2, 3, 4, and 5 to represent "targets" for prevention. In other words, what is the single largest contributing cause to burns numerically in this population? (See Table 17.) Black females, grades 5-8, represent 20.7% of all burns due to household causes. White males, grades K-4 and 5-8, represent 41.3% of all burns due to outdoor causes. White males and females, grades K-4, represent 39.4% of all other causes. White females and males, grades 5-8, represent 44.6% of all miscellaneous causes.

The frequencies of self-reported burns by cause and individual school by location are shown in Table 18. The miscellaneous rows in this table require an explanation. Since miscellaneous causes are responsible for 5.9% of the total burns, it was determined that these causes should be reevaluated to specify the percentage of miscellaneous causes that are household, outdoor, and other. Of the 210 miscellaneous burns, 53.1% were found to be secondary to household causes, and 36.2% were outside causes. The remaining 10.6% of the miscellaneous causes were placed under other causes. After determining these percentages, the 5.9% miscellaneous causes could be broken down into 3.1% household, 2.1% outdoor, and .7% other.

Certain tables were designed primarily for health educators. (See Tables 19, 20, and 21.) These tables list the four leading causes of burns in rank order grouped by race, sex, and grade. The percentages of total burns that are preventable through efforts directed at these four leading causes are shown in Tables 20 and 21. To fulfill the project's goal of providing information to health

FIGURE 2.--Household Causes

CAUSES OF BURNS



WM = White Male
BM = Black Male
WF = White Female
BF = Black Female

FIGURE 3.--Outdoor Causes

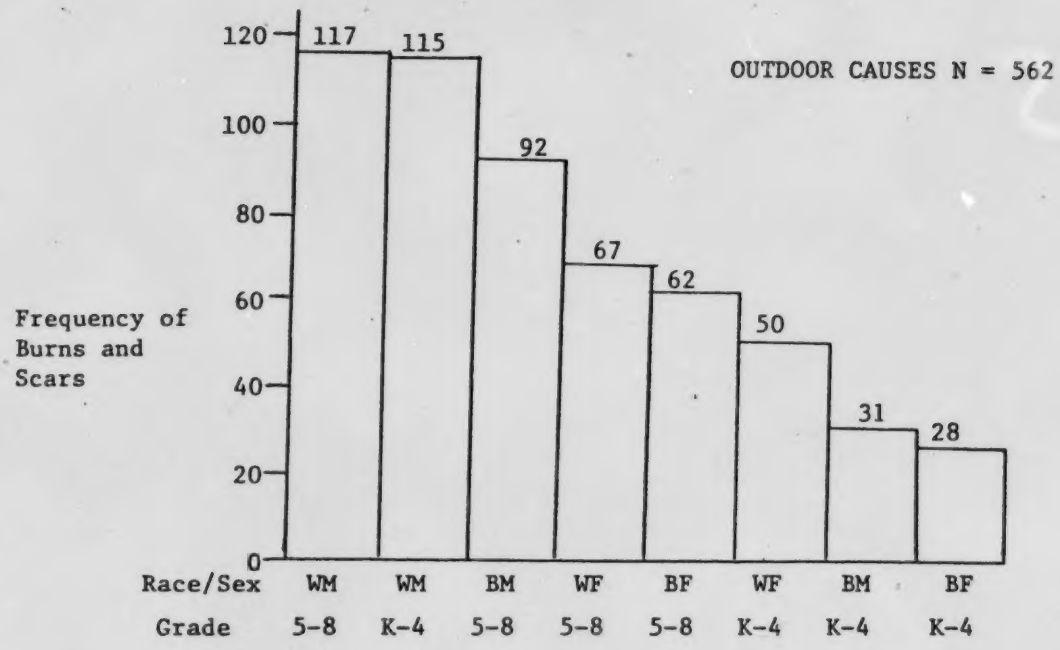
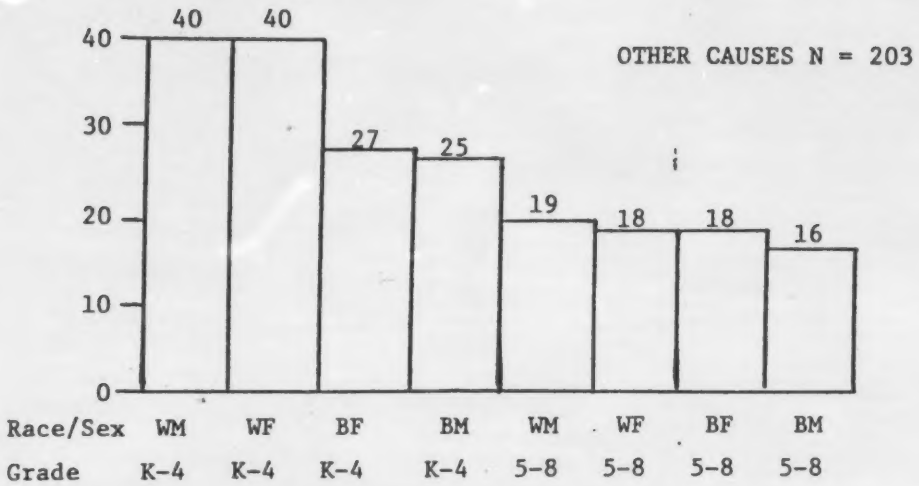
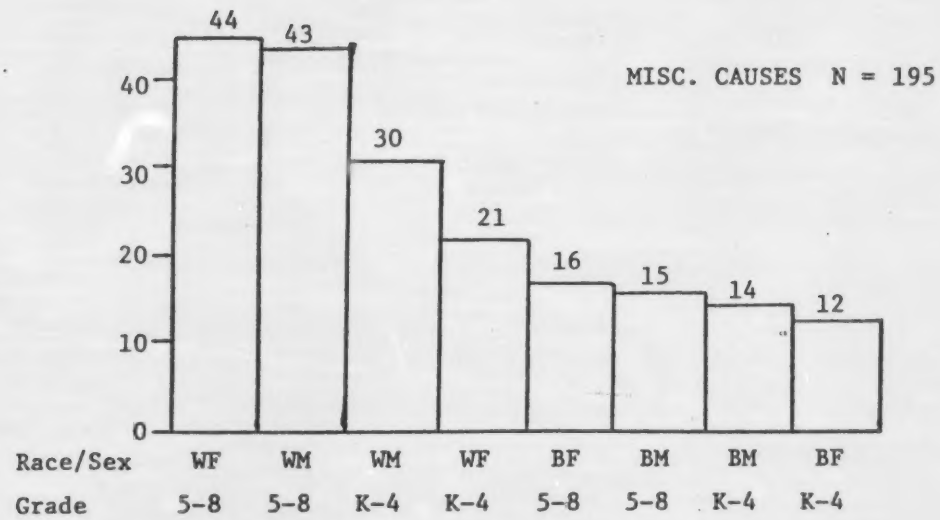


FIGURE 4.--Other Causes



*Cigarettes, House Fire, Abuse

FIGURE 5.--Miscellaneous Causes



*Electrical, Hot Metal, Sun, Gas, Plastics

TABLE 17.--Frequencies of Burn Causes by Categories, Regardless of Severity, by Eight Groups (Race-Sex-Grade).

Cause Category	White Male		Black Male		White Female		Black Female		Total	Percent
	K-4	5-8	K-4	5-8	K-4	5-8	K-4	5-8		
Household Causes	232	198	193	317	301	307	290	481	2319	75.2
Outdoor Causes	115	117	31	92	50	67	28	62	562	18.2
Other Causes	40	19	25	16	40	18	27	18	203	6.6
TOTAL	387	334	249	425	391	392	345	561	3084	100.0
PERCENT	12.5	10.8	8.1	13.8	12.7	12.7	11.2	18.2	100.0	

TABLE 18.--Frequencies of Self-Reported Burns, Regardless of Severity, by Cause and School.

	SUBURBAN			URBAN				RURAL				MIL		
Burn Cause	Sti	Wal	Spr	Sim	Mem	NCh	Rhe	Sch	Hau	Bax	Lin	Hun	Total	Percent
HOUSEHOLD CAUSE:	328	344	193	291	224	181	226	213	172	65	66	177	2480	74.4
Cooking	210	205	114	94	71	87	65	60	74	35	24	111	1150	33.5
Irons	42	63	29	132	84	32	103	58	43	16	8	23	633	17.9
Scalds	63	61	41	25	42	41	30	46	24	8	13	39	433	12.5
Heaters	13	15	9	40	27	21	28	49	31	6	21	4	264	7.4
Misc.*														3.1
OUTDOOR CAUSES:	99	121	74	28	28	47	18	70	58	18	17	42	565	19.6
Open Fire	66	68	52	23	22	33	12	48	37	14	10	30	415	11.7
Automobile	16	36	13	0	1	9	3	19	19	3	3	8	130	3.7
Firecracker	17	17	9	5	5	5	3	3	2	1	4	4	75	2.1
Misc.**														2.1
OTHER CAUSES:	37	18	26	26	31	25	6	2	11	8	7	29	226	7.0
Cigarettes	34	17	22	13	25	19	5	0	7	5	3	27	177	5.0
House Fire	2	0	3	5	6	4	1	1	2	2	2	2	30	.8
Abuse	1	1	1	8	0	2	0	1	2	1	2	0	19	.5
Misc.***														.7
TOTAL MISC.	51	33	27	16	14	15	4	8	11	7	6	18	210	5.9
OVERALL TOTAL	515	516	320	361	297	268	254	293	252	98	96	266	3536	100.0
PERCENT	14.6	14.6	9.0	10.2	8.4	7.6	7.2	8.3	7.1	2.8	2.7	7.5	100.0	

*Includes electrical and hot metal burns
**Includes sunburn and gasoline spills
***Includes hot plastics

TABLE 19.--Four Leading Causes of Burns Grouped by Eight Groups (Race-Sex-Grade)

RANKED CAUSES	White Male		Black Male		White Female		Black Female	
	K-4	5-8	K-4	5-8	K-4	5-8	K-4	5-8
First Cause	Cooking	Cooking	Cooking	Irons	Cooking	Cooking	Irons	Irons
Second Cause	Open Fire	Open Fire	Irons	Open Fire	Scalds	Scalds	Cooking	Cooking
Third Cause	Scalds	Scalds	Scalds	Heaters	Cigarette	Irons	Scalds	Scalds
Fourth Cause	Cigarette	Auto, etc.	Heaters	Scalds	Open Fire	Open Fire	Heaters	Heaters
Rate per 1000	683	678	654	654	767	725	732	761
Demoninator	464	407	295	543	430	455	396	632
Percent of Total Burns	68.3	67.8	65.4	65.4	76.7	72.5	73.2	76.1

TABLE 20.--Causes of Burns by Race-Sex Groups for Grades K-4

Rank	White Male K-4	Black Male K-4	White Female K-4	Black Female K-4
First	Cooking	Cooking	Cooking	Irons
Second	Open Fire	Irons	Scalds	Cooking
Third	Scalds	Scalds	Cigarette	Scalds
Fourth	Cigarette	Heaters	Open Fire	Heaters
*Rate per 1000	683	654	767	732
Percent	68.3	65.4	76.7	73.2

*Denominators are white male 464, black male 295, white female 430, and black female 396.

TABLE 21.--Causes of Burns by Race-Sex Groups for Grades 5-8

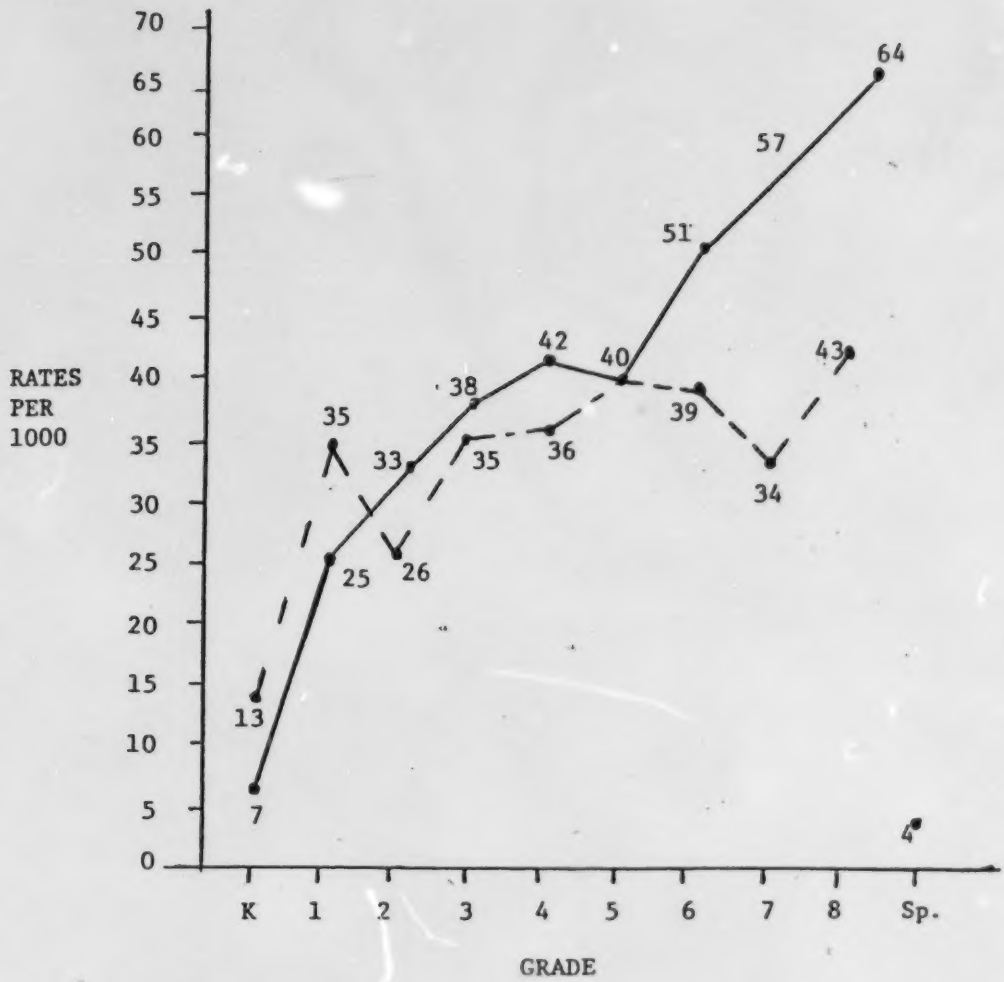
Rank	White Male 5-8	Black Male 5-8	White Female 5-8	Black Female 5-8
First	Cooking	Irons	Cooking	Irons
Second	Open Fire	Open Fire	Scalds	Cooking
Third	Scalds	Heaters	Irons	Scalds
Fourth	Auto, etc.	Scald	Open Fire	Heaters
*Rate	678	654	725	761
Percent	67.8	65.4	72.5	76.1

*Denominators are white male 407, black male 543, white female 455, black female 632.

educators, teachers, and firemen prior to Fire Prevention Week 1980, a preliminary handout was presented at the Charleston County Health Department in September, 1980. This handout represents the information available at the time of the report (See Appendix E).

Rates per 1000 children of grades K-8 and special education by self-reported burn status are shown in Figure 6. It can be observed, as well as statistically proven by the least squares method, that the relationship between grade and number of scars is a positive linear one. The calculated t value equals 9.4299, and the tabulated t value equals 1.8946 ($p < .05$). If the sample had been random, it could be stated that for every increase in grade, there is a corresponding increase in scars. The same statements are also true for the relationship between grade and number of burns. The calculated t value equals 2.99, and the tabulated t value equals 1.8946 ($p < .05$).

Figure 6.--BURN STATUS BY GRADE



KEY: _____ = Scar

_ _ _ = Burn

DISCUSSION

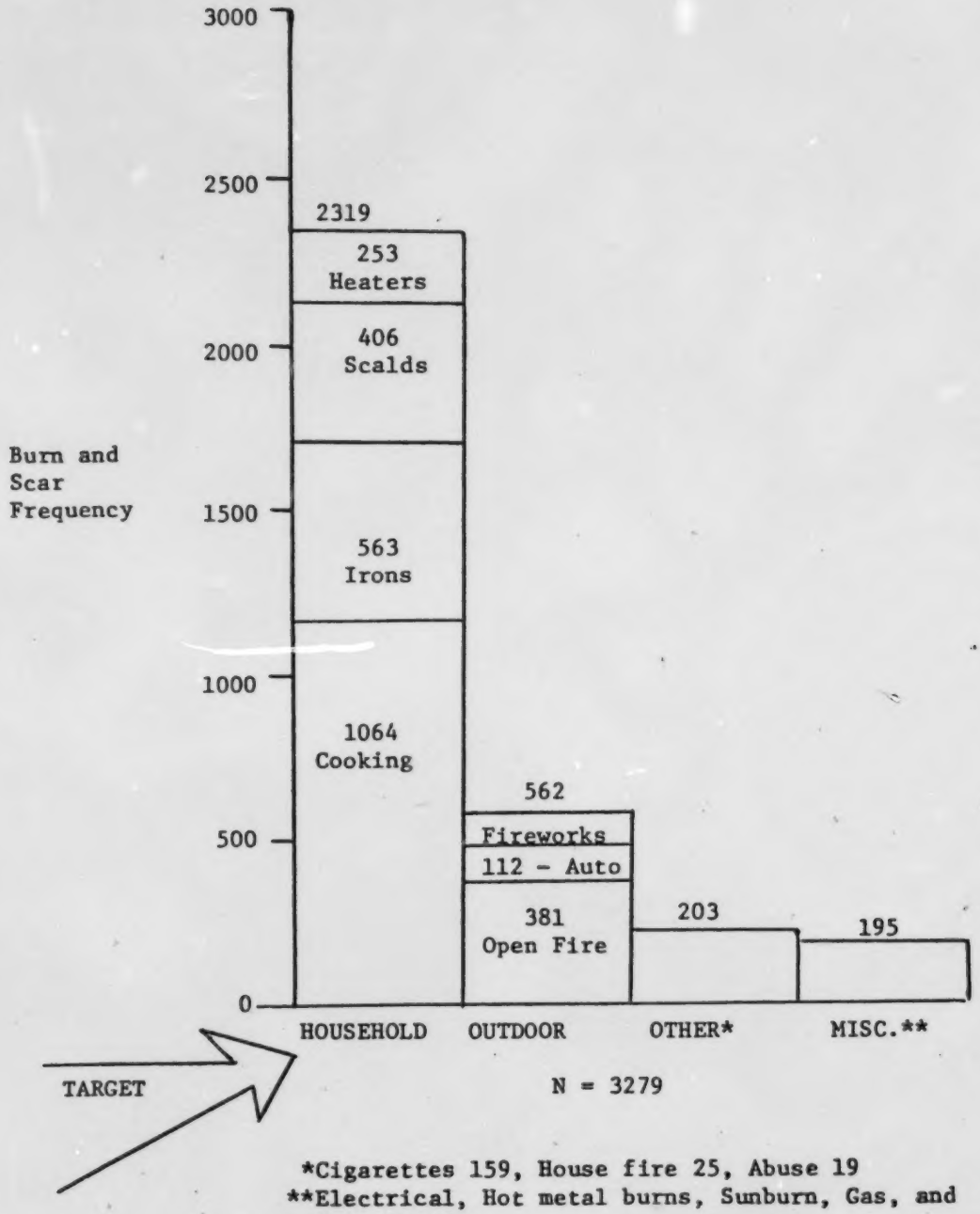
In reviewing past medical records of pediatric burn patients treated in the Physical Therapy Department at the Medical University Hospital, Charleston, South Carolina, ninety-five cases were treated between July, 1971 and December, 1980. Of these ninety-five cases, forty lived in the surrounding area which characterizes M.U.S.C. as a referral medical center. Of these forty burns, eighteen of these were black males. Relevant to this discovery is the fact that 189/1000 black males, grades 5-8, did not know or bother to report their burn cause suggesting that black males probably underreport the fact of burns and the cause of burns in the school survey. Also, the number of black males, grades K-4, at risk of being burned is 292. This reveals serious underreporting by young black males. Reasons for this can only be speculated upon. This group could simply be uninterested in completing the survey, or then may not have the reading and writing skills needed to report their burn experience. This underreporting must be recognized, and data cannot be adjusted to accommodate this deficiency. Underreporting by black males is not unique to this study. This is a problem the United States Census Bureau has had in obtaining a full measure of participation of black males in census interviewing.[4]

The 1974 Upstate New York Survey of Hospitalized Burn Injuries demonstrated that hot liquids and beverages are responsible for more

than one-fourth of the total burn cases.[5] Of the forty local burns treated at M.U.S.C., five were scalds. Most burns occur in the home, usually in the kitchen, involving housewives and children under fifteen.[6] This is consistent with the survey results, as well as, in the review of charts and the Boston Burn Project (See Figure 7).[7] Of the 3,279 burn causes reported in the survey, 2,319 are household (70.7%). Combustion injuries become more prominent in older children.[8] These injuries occur outside the home and are due to children playing with matches and gasoline.[7] The Boston Burn Project reports older boys in the age group 7-12 begin to have burn accidents from playing and working with flammable liquids, most often gasoline. The findings from this study are consistent with these other studies (See Figure 3).

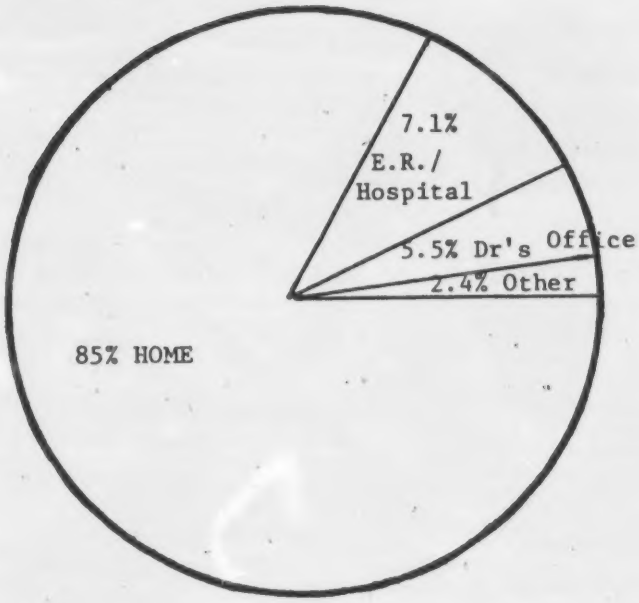
A study to estimate the frequency of episodes of serious risk of drowning was performed in South Carolina and revealed that death certificates and serious episodes of near-drowning demonstrated only a tip of the iceberg of persons subjected to a serious risk of death by drowning.[9] This iceberg phenomenom is also applicable to burn injuries. Those injuries treated in hospitals and burn centers, as well as those that are fatal, are only a tip of the iceberg of persons subject to a serious risk of sustaining severe burns or death due to burns. Eighty-five percent of all burns reported in this survey were treated at home, and this indicates the number of potentially serious burns that are never seen in hospitals, emergency rooms, and doctor's offices (See Figure 8). The question regarding post-burn scarring was an effort to obtain a severity index. Due to confusion in the younger age group, the index is questionable. Of the 3,788 scars and burns reported, 2,044 resulted in a self-report of

FIGURE 7.--Causes of Burns



*Cigarettes 159, House fire 25, Abuse 19
**Electrical, Hot metal burns, Sunburn, Gas, and Hot plastics.

Figure 8.--PLACE OF BURN TREATMENT



scarring and demonstrating a 54% severity of burn index.

Sources of morbidity data are limited because of their restriction to certain population groups.[4] To obtain a true picture of a definite geographical area, those who do not consult a doctor, the emergency room, or hospital must be included.[10] A desire to obtain information on illness in the general population has been responsible for the development of morbidity surveys.[4] The number of personal characteristics available for study is not as limited as in analysis of mortality, where information must be obtained from death certificates. Schools provide an opportune setting through which one can reach large numbers of people quickly and maintain contact relatively easily.[3]

Difficulties in the data must be considered in assessing findings from morbidity surveys. It must be remembered that this was a prevalence study, and the survey asked the child if they had ever been burned. Chronic conditions have a degree of underreporting that is varied with the length of time between initial onset and the survey or interview.[4] The survey instrument used for the pilot study asked the student to report the date and time of his/her injury, but this was rarely completed. This survey is subject to the recall of the student, in addition to being dependent upon the student's ability to read and write. It has been stated that sex and age do not influence the degree of underreporting.[4] This study does not support this conclusion due to the low number of black males, grades K-4, that returned their surveys, and the high number (189/1000) of black males that report a burn, but no burn cause or narrative.

It has also been noted that parental treatment of fresh burns prior to medical attention reveals lack of knowledge concerning the

proper manner in which to handle fresh burns.[11] This void in knowledge was also evident in school children. Only 56.7% of the school children responded correctly to the question regarding what you put on a burn immediately after it occurs.

SUMMARY

If this survey was repeated, the number of surveys could be decreased by using a random sample. To conduct the survey more consistently, trained nurses and staff should be used if financial resources are available. A mechanism to elicit interest in reporting from black males would have to be implemented. The study was planned, implemented, and analyzed by individuals who were interested in their community and were willing to provide their services. The project had few financial resources, but required time, energy and interest.

In retrospect, the teamwork between the Public Health Department, school administrators, pupils, and M.U.S.C. consultants is reflected in a survey that achieved an 86.5 percent response rate, 80.7 percent validation response rate, and a total of 5,671 satisfactory questionnaires. To our knowledge, no similar county-wide survey of public school children has yet yielded such diverse and detailed information on common causes of home treated burns. The implications for preventive health education are obvious; to bring some specificity and relevance to burn prevention in each and every grade in the curriculum.

APPENDIX A

CHARLESTON BURN PROJECT

TO: Charleston County School Board

SUBMITTED BY:

Co-Investigators: Dr. Stan Schumann

Ms. Charlyne Littlefield, R.P.T.

Charleston Burn Project Staff:

Ms. Lynn Brown - Health Department

Mr. Ken Buhmeyer - M.U.S.C.

Ms. Marsha Campbell - Fire Department

Dr. J. C. Chambers - Health Department

Dr. Steven Dewees - M.U.S.C.

Mr. Robert Humphrey - Fire Department

Ms. Dorothy Hutchinson - Fire Department

Dr. H. Biemann Othersen, Jr. - M.U.S.C.

Dr. Demetrios A. Papadopoulos - M.U.S.C.

Mr. Matt Shiers - Consumer Product Safety

Ms. Dawn Teater - Charleston County Schools

Ms. Lynn Tucker - M.U.S.C.

Ms. Patricia Babb - M.U.S.C.

All Area Fire Chiefs

Address: Dr. Stan Schumann
Department of Family Practice
171 Ashley Avenue
Medical University of South Carolina
Charleston, South Carolina 29425
Telephone: 792-2411

The basic features for this proposal were reviewed on November 26, 1979 with the Medical Advisory Group and was unanimously approved.

I. PURPOSE OF THIS STUDY:

This survey will enable us to obtain information from children in grades one through eight and special education classes on:

A) Information about personal burn experiences

B) Knowledge of prevention and treatment of burns

C) Recommendations for improving health education in this important area.

II. INDIVIDUAL OBJECTIVES FOR PARTICIPANTS:

As a result of the survey, each student will have the chance to:

A) Report and describe his worst burn and its causation

B) Test his knowledge of three clinical facts on emergency management of burns.

C) Correct misinformation after questionnaires are completed.

III. BRIEF DESCRIPTION OF STUDY:

The target population is grades one through eight and special education classes within each school selected for survey purposes. Eleven schools have been selected to represent a cross section of urban, rural, upper, and lower income populations. These represent fourteen percent of the total enrolled school population. These schools are listed in alphabetical order. Previous experience in school surveys for other health purposes (Ms. Dawn Teater) indicates that these schools represent a cross section and would be cooperative in such a study.

SCHOOL	NUMBER OF STUDENTS ENROLLED
Baxter Patrick Elementary	260
Hautgap Middle School	500
Hunley Park Elementary	570
James Simmons Elementary	750
Lincoln Middle School	250
Rhett Middle School	570
Schroder Middle School	700
Springfield Elementary	600
Wallace Middle School	804
Whitesides Elementary	724
Tillman Elementary	740
TOTAL	6468

IV. WHAT WILL BE REQUIRED:

A) Students will read and complete the survey form in the classroom under supervision of the teacher, with assistance available from school nurses and the Charleston Burn Project Staff.

B) Forms will be collected from the students by the teachers and then picked up from each school by Burn Project Staff. No transportation will be required of school system personnel.

C) Time needed to complete questionnaire will vary according to:

1) Grade level

2) Reading ability

3) Extent of burn experience

A pilot study indicates that the maximum time for the slower students is less than thirty minutes.

D) No direct involvement of parents is anticipated.

E) To assure accuracy of the burn survey, a small percent (10% or less) of the students with burn scars will be validated by means of review of health records with each school nurse.

V. CONFIDENTIALITY:

Names will not be used to assure confidentiality.

VI. WHEN:

Time is of the essence to get this survey completed in March and April, 1980 in order to minimize conflict with termination of school activities in May, 1980. The time schedule for each

school will be arranged individually at each school's convenience within the eight week burn survey period. It is essential for the results to be processed prior to October, 1980 before Fire Prevention Week begins. The results of the survey can be utilized by teachers, firemen, and curriculum development staff in identifying lack of knowledge in target populations concerning fire and burn safety.

VII. BENEFITS AND IMPACT ON INSTRUCTIONAL PROCESS:

The results of this survey will be made available to the curriculum development staff for implementation and integration into ongoing curriculum. This survey will be beneficial for numerous reasons.

A) Educational experience in itself by directing attention to burn safety and actual burn experience.

B) Reduce long term absences from school secondary to burn injuries.

C) Reduce costs to parents and community for burns.

D) Effective mechanism for contact with children at high risk who are hard to reach with vital safety information.

E) Enable those involved with Fire Prevention Week to associate fire prevention with burn prevention.

APPENDIX B

CODE KEY FOR THE CHARLESTON BURN SURVEY

COLUMN

1-20 . . . . . Name - last, first

21-23 . . . . . School - u=urban; r=rural; s=suburban
m=military

BAX:	Baxter (r)	SCH:	Schroder (r)
HAU:	Haut Gap (r)	SPR:	Springfield (s)
HUN:	Hunley Park (m,s)	WAL:	Wallace (s)
SIM:	Simmons (u)	MEM:	Memminger (u)
LIN:	Lincoln (r)	NCH:	N. Chas. (s)
RHE:	Rhett (u)	STI:	Stiles Point (s)

24 . . . . . Grade - K, S, 1-8

24-34 . . . . . Teacher - last name

35-36 . . . . . Burn status - S=Burn with scar
B=Burn, no scar
N=No burn
DK=Do not know
AB=Absent

37 . . . . . Sex - 1=Boy; 2=Girl, 9=Do not know

38-39 . . . . . Age - 04-18, 99=Do not know

40 . . . . . Race - 1=Black; 2=White; 3=Other; 9=Do not know

41 . . . . . Narrative quality - 1=Satisfactory
2=Maybe okay
9=Do not know

42-43 . . . . . Specific burn cause - 01-34, 99=Do not know

44-45 . . . . . Causes in groups - 01-12, 99=Do not know

01 Cooking utensils, grease, fat, oil, etc.
02 Scald, steam, hot liquids, water, tea, soup
03 Cigarettes, cigars, lighters
04 Heaters, electrical
05 Heaters, gas, wood, coal

06 Iron, curling and clothes, hot comb
07 Automobile, motorcycle, lawnmower
08 Open fire, candle, matches, fireplace, grill
09 Firecracker, sparkler
10 House fire
11 Abuse by another person
12 Other

46 . . . . . Place of treatment - 1=Home; 2=Doctor's office
3=ER/Hospital; 4=Other
9=Do not know

47 . . . . . Home fire - 1=Yes; 2=No; 9=Do not know

48 . . . . . Smoke detector - 1=Yes; 2=No; 9=Do not know

49 . . . . . Escape plan - 1=Yes; 2=No; 9=Do not know

50 . . . . . Quiz #1 - 1=Roll; 2=Run; 3=Shower; 9=Do not know

51 . . . . . Quiz #2 - 1=Ointment; 2=Water; 3=Butter;
9=Do not know

52 . . . . . Quiz #3 - 1=Walk; 2=Run; 3=Crawl; 9=Do not know

53 . . . . . ANOTHER burn that left a scar - 1=Yes; 2=No
9=Do not know

54-55 . . . . . Validated burn status - S=Burn with scar
B=Burn, no scar
N=No burn
DK=Do not know
AB=Absent

56-57 . . . . . Specific burn cause - 01-34, 99=Do not know

58-59 . . . . . Causes in groups - 01-12, 99-Do not know

60-61 . . . . . Body area burned - 01-09, 99=Do not know

01 Head, face, and neck
02 Chest and sides
03 Abdomen
04 Back and buttocks
05 Arm
06 Hands and fingers
07 Legs and thighs
08 Feet and toes
09 Multiple areas
99 Do not know

List of Causes (Columns 42-43)

01 Ashes
02 Lighter
03 Candle
04 Campfire
05 Car pipe
06 Cigarette
07 Coffee
08 Cooking utensils
09 Curling iron
10 Electric stove
11 Firecrackers
12 Fireplace
13 Gasoline heater
14 Grease
15 Grill
16 Heater
17 Hot curlers
18 Hot pot
19 Hot water
20 House fire
21 Iron
22 Kitchen stove
23 Lamp
24 Lawnmower
25 Light bulb
26 Matches
27 Motor bike
28 Pots and pans
29 Soup
30 Sparklers
31 Steam
32 Tea
33 Wood heater
34 Other
99 Don't know

APPENDIX C

BURN PROJECT ANALYSIS

I. Important Items

A. Rank Order

1. Burn status reported by nurse.
2. Burn cause reported by nurse
3. Have you ever been burned?
4. How did it happen?
5. Did the burn leave a scar?
6. Where was this burn treated?
7. Race
8. Grade
9. Sex
10. Age.

B. Most Valid Items

1. First

a. Sex
b. Race
c. Age
d. Grade
e. Burn status reported by nurse.
f. Burn cause reported by nurse

2. Second

a. Have you ever been burned?
b. How did it happen?
c. Where was this burn treated?

3. Third

a. Did the burn leave a scar?
b. Have you ever had another burn that left a scar?
c. Quiz questions.

II. Hypotheses in Rank Order

A. H_o: The proportion of validation for white males, black males, white females, and black females is the same.

H_o: $P_{wm} = P_{bm} = P_{wf} = P_{bf}$

B. H_o: The proportion of validations for grade groups K-4, 5-8, and special education is the same.
H_o: $P_{k-4} = P_{5-8} = P_{sp.\ ed.}$

C. H_o: Burn cause groups for white males, black males, white females, and black females are the same.
H_o: $P_{wm} = P_{bm} = P_{wf} = P_{bf}$

D. H_o: Relative frequencies of all burn cause groups are the same.
H_o: $P_{cooking} = P_{iron} = P_{scalds} = P_{heater} = P_{open\ fire} = P_{automobile} = P_{firecracker} = P_{cigarette} = P_{house\ fire} = P_{abuse} = P_{miscellaneous}$

E. H_o: The proportion of validations for nurses with known burn status and nurses with unknown burn status is the same.
H_o: $P_{known} = P_{unknown}$

F. H_o: Burns treated at home, E.R./hospital, doctor's office, and other are the same.
H_o: $P_{home} = P_{E.R./hospital} = P_{doctor's\ office} = P_{other}$

G. H_o: The proportion of correct answers for three quiz questions for white males, black males, white females, and black females is the same.
H_o: $P_{wm} = P_{bm} = P_{wf} = P_{bf}$

III. Hypotheses with Matched Items

A. Hypothesis A

1. Burn status reported by nurse.
2. Have you ever been burned?
3. Did the burn leave a scar?

B. Hypothesis B

1. Burn status reported by nurse.
2. Have you ever been burned?
3. Did the burn leave a scar?
4. Grade

C. Hypothesis C

1. How did it happen?
2. Sex
3. Race

D. Hypothesis D

1. How did it happen?

E. Hypothesis E

1. Burn status reported by nurse.
2. Have you ever been burned?
3. Did the burn leave a scar?

F. Hypothesis F

1. Have you ever been burned?
2. Did the burn leave a scar?
3. Where was your burn treated?

G. Hypothesis G

1. Quiz question #1
2. Quiz question #2
3. Quiz question #3

APPENDIX D

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TABLE 22.--Frequencies of Self-Reported Burn Status by Four Race-Sex Groups and Two Grade Groups. Special Education Classes are Not Included.

Race-Sex Group	Grade	Burn Status					
		Scar and Burn	Scar	Burn	No Burn	Total	Percent
White males	K-4	444			255	699	13.4
	5-8		144	245	92	481	9.2
Black males	K-4	283			261	544	10.4
	5-8		350	181	299	830	15.9
White females	K-4	418			288	651	12.5
	5-8		157	283	68	508	9.8
Black females	K-4	380			234	614	11.8
	5-8		476	133	271	880	16.9
TOTAL	K-4	1,525			983	2,508	48.2
	5-8		1,127	842	730	2,699	51.8
PERCENT	K-4	60.8			39.2	100	
	5-8		41.8	31.2	27.0	100	

TABLE 23.--Frequencies of Self-Reported Burn Status by Sex for Special Education Classes, Grades K-8.

Sex	Burn Status				
	Scar	Burn	No Burn	Total	Percent
Male	12	14	15	41	56.9
Female	8	12	11	31	43.0
Total	20	26	26	72	100.0
Percent	27.8	36.1	36.1	100.0	

TABLE 24.--Frequencies of Self-Reported Burn Status by Sex for Special Education Classes for Ages Sixteen to Nineteen.

Sex	Burn Status				
	Scar	Burn	No Burn	Total	Percent
Male	18	8	21	47	87.0
Female		2	5	7	13.0
Total	18	10	26	54	100.0
Percent	33.3	18.5	48.1	100.0	

TABLE 25.--Frequencies of Burn Causes by Self-Reported Burn Status and Two Grade Groups.

Burn Cause	Burn Status								
	Scar & Burn K-4	Scar 5-8	Burn 5-8	Total K-4	Total 5-8	Total All Grades	Percent K-4	Percent 5-8	Percent All Grades
HOUSEHOLD CAUSES:	1056	782	534	1056	1316	2372	44.5	55.5	73.2
Cooking	523	271	303	523	564	1097	47.7	52.3	32.5
Irons	266	261	85	266	346	612	43.5	56.5	18.1
Scalds	176	121	111	176	232	408	43.1	56.9	12.0
Heaters	91	129	35	91	164	255	35.7	64.3	7.5
Misc.*									3.1
OUTDOOR CAUSES:	232	203	153	232	356	588	39.5	60.5	19.5
Open Fire	179	119	96	179	215	394	45.4	54.6	11.7
Automobile	29	70	27	29	97	126	23.0	77.0	3.7
Firecracker	24	17	30	24	44	68	35.3	64.7	2.0
Misc.**									2.1
OTHER CAUSES:	145	43	26	145	69	214	67.8	32.2	7.0
Cigarettes	119	30	20	119	50	169	70.4	29.6	5.0
House Fire	17	7	3	17	10	27	63.0	37.0	.8
Abuse	9	6	3	9	9	18	50.0	50.0	.5
Misc.***									.7
TOTAL MISC.	80	47	73	80	120	200	40.0	60.0	5.9
OVERALL TOTAL	1513	1075	786	1513	1661	3174	44.8	55.2	100.0
PERCENT	100.0	57.8	42.2	44.8	54.9	100.0			

*Includes electrical and hot metal burns.
**Includes sunburn and gasoline spills.
***Includes hot plastics.

TABLE 26.--Frequencies of Burn Causes, Regardless of Severity, by Eight Groups (Race-Sex-Grade) and By Sex Totals

Burn Cause	White Male K-4	White Male 5-8	Black Male K-4	Black Male 5-8	Total Male K-4	Total Male 5-8	White Female K-4	White Female 5-8	Black Female K-4	Black Female 5-8	Total Female K-4	Total Female 5-8	Total K-4	Total 5-8	Percent K-4	Percent 5-8
HOUSEHOLD CAUSES:	232	198	193	317	425	515	301	307	290	481	591	788	1016	1303	43.8	56.2
Cooking	146	130	78	111	224	241	193	195	84	127	277	322	501	563	47.0	52.9
Irons	21	13	67	87	88	100	32	45	138	193	170	238	258	338	43.5	56.7
Scalds	50	44	17	58	67	102	64	53	38	82	102	135	169	137	41.6	58.4
Heaters	15	11	31	61	46	72	12	14	30	79	42	93	88	165	43.8	65.2
Misc.*															21.0	32.1
OUTDOOR CAUSES:	115	117	31	92	146	209	50	67	28	62	78	129	224	338	39.9	60.1
Open Fire	87	64	24	62	111	126	36	37	25	46	61	83	172	209	45.1	54.9
Automobile	13	38	2	16	15	54	11	19	1	12	12	31	27	85	24.1	75.9
Firecracker	15	15	5	14	20	29	3	11	2	4	5	15	25	44	36.2	63.7
Misc.**															14.1	21.9
OTHER CAUSES:	40	19	25	16	65	35	40	18	27	18	67	36	132	71	65.0	35.0
Cigarettes	34	17	16	7	50	24	37	15	21	12	58	27	108	51	68.0	32.1
House Fire	5	0	2	5	7	5	3	1	5	4	8	5	15	10	60.0	40.0
Abuse	1	2	7	4	8	6	0	2	1	2	1	4	9	10	47.4	52.6
Misc.***															4.2	5.6
TOTAL MISC.	30	43	14	15	44	58	21	44	12	16	33	60	77	118	39.5	60.5
OVERALL TOTAL	417	377	263	440	680	817	412	436	357	577	769	1013	1449	1830	44.2	55.8
PERCENTAGES TOTAL BURN	12.7	11.5	8.0	13.4	20.7	24.9	12.6	13.3	10.9	17.6	23.5	30.9	44.2	55.8		
PERCENTAGES EACH GROUP	61.3	46.1	38.7	53.9	100	100	53.6	43.0	46.4	57.0	100	100				

*Includes electrical and hot metal burns
**Includes sunburn and gasoline spills
***Includes hot plastics

TABLE 27.--Frequencies of Burn Causes by Race Grade Groups.

Burn Cause	Race-Grade Groups							
	Black		White		Total		Total All Grades	Percent All Grades
	K-4	5-8	K-4	5-8	K-4	5-8		
HOUSEHOLD CAUSES:	483	598	533	505	1016	1303	2319	73.8
Cooking	162	238	339	325	501	563	1064	32.4
Irons	205	280	53	58	258	338	596	18.2
Scalds	55	140	114	97	169	237	406	12.4
Heaters	61	140	27	25	88	165	253	7.7
Misc.*								3.1
OUTDOOR CAUSES:	59	154	165	184	224	338	562	19.2
Open Fire	49	108	123	101	172	209	381	11.6
Automobile	3	28	24	57	27	85	112	3.4
Firecracker	7	18	18	26	25	44	69	2.1
Misc.**								2.1
OTHER CAUSES:	52	34	80	37	132	71	203	7.0
Cigarettes	37	19	71	32	108	51	159	4.8
House Fire	7	9	8	1	15	10	25	.8
Abuse	8	6	1	4	9	10	19	.6
Misc.***								.7
TOTAL MISC.	26	31	51	87	77	118	195	5.9
OVERALL TOTAL	620	1017	829	813	1449	1830	3279	100.0
PERCENTAGES TOTAL BURN	18.9	31.0	25.2	24.8	44.2	55.8	100.0	
PERCENTAGES EACH RACE	42.8	55.6	57.2	44.4	100.0	100.0		

*Includes electrical and hot metal burns
**Includes sunburn and gasoline spills
***Includes hot plastics

TABLE 28.--Frequencies of Burn Causes by Sex Grade Groups

Burn Cause	Sex-Grade Groups							
	Male		Female		Total		Total All Grades	Percent All Grades
	K-4	5-8	K-4	5-8	K-4	5-8		
HOUSEHOLD CAUSES:	425	515	591	588	1016	1303	2319	73.8
Cooking	224	241	277	322	501	563	1064	32.4
Irons	88	100	170	238	258	338	596	18.2
Scalds	67	102	102	135	169	137	406	12.4
Heaters	46	72	42	93	88	165	253	7.7
Misc.*								3.1
OUTDOOR CAUSES:	146	209	78	129	224	338	562	19.2
Open Fire	111	126	61	83	172	209	381	11.6
Automobile	15	54	12	31	27	85	112	3.4
Firecracker	20	29	5	15	25	44	69	2.1
Misc.*								2.1
OTHER CAUSES:	65	35	67	36	132	71	203	7.0
Cigarettes	50	24	58	27	108	51	159	4.8
House Fire	7	5	8	5	15	10	25	.8
Abuse	8	6	1	4	9	10	19	.6
Misc.***								.7
TOTAL MISC.	44	58	33	60	77	18	195	5.9
OVERALL TOTAL	680	817	769	1013	1449	1830	3279	100.0
PERCENTAGES TOTAL BURN	20.7	24.9	23.5	30.9	44.2	55.8	100.0	
PERCENTAGES EACH SEX	46.9	44.6	53.1	55.4	100.0	100.0		

*Includes electrical and hot metal burns
**Includes sunburn and gasoline spills
***Includes hot plastics

TABLE 29.--Frequencies of Scars, Burns, and No Burns By Home Fires for Race-Sex-Grade Groups.

White Male

Burn Status	Grade Group	Home Fire +	Home Fire -	Total	Percent
Scar	K-4	67	105	172	39.4
	5-8	57	84	141	36.9
Burn	K-4	61	203	264	60.5
	5-8	72	169	241	63
Total	K-4	128	308	436	100
	5-8	129	253	382	100
Percent	K-4	29.3	70.6	100	
	5-8	33.7	66.2	100	

Black Male

Burn Status	Grade Group	Home Fire +	Home Fire -	Total	Percent
Scar	K-4	62	100	162	59.5
	5-8	95	253	348	66.5
Burn	K-4	21	89	110	40.4
	5-8	43	132	175	33.4
Total	K-4	83	189	272	100
	5-8	138	385	523	100
Percent	K-4	30.5	69.4	100	
	5-8	26.3	73.6	100	

TABLE 29 - Continued

White Female

Burn Status	Grade Group	Home Fire +	Home Fire -	Total	Percent
Scar	K-4	39	104	143	34.8
	5-8	48	107	155	35.5
Burn	K-4	67	200	267	65.1
	5-8	79	202	281	64.4
Total	K-4	106	304	410	100
	5-8	127	309	436	100
Percent	K-4	25.8	74.1	100	
	5-8	29.1	70.8	100	

Black Female

Burn Status	Grade Group	Home Fire +	Home Fire -	Total	Percent
Scar	K-4	62	187	249	66.7
	5-8	95	372	467	77.8
Burn	K-4	23	101	124	33.2
	5-8	39	94	133	22.1
Total	K-4	85	288	373	100
	5-8	134	466	600	100
Percent	K-4	22.7	77.2	100	
	5-8	22.3	77.6	100	

TABLE 29 - Continued

White Male

Burn Status	Grade Group	Home Fire +	Home Fire -	Total	Percent
Scar and Burn	K-4	128	308	436	64.2
	5-8	129	253	382	81.2
No Burn	K-4	42	201	243	35.7
	5-8	25	63	88	18.7
Total	K-4	170	509	679	100
	5-8	154	316	470	100
Percent	K-4	25	74.9	100	
	5-8	32.7	67.2	100	

Black Male

Burn Status	Grade Group	Home Fire +	Home Fire -	Total	Percent
Scar and Burn	K-4	83	189	272	52.1
	5-8	138	385	523	64.9
No Burn	K-4	30	220	250	47.8
	5-8	45	237	282	35.0
Total	K-4	113	409	522	100
	5-8	183	622	805	100
Percent	K-4	21.6	78.3	100	
	5-8	22.7	77.2	100	

TABLE 29 - Continued

White Female

Burn Status	Grade Group	Home Fire +	Home Fire -	Total	Percent
Scar and Burn	K-4	106	304	410	64.6
	5-8	127	309	436	86.7
No Burn	K-4	32	193	225	35.4
	5-8	4	63	67	13.3
Total	K-4	138	497	635	100
	5-8	131	372	503	100
Percent	K-4	21.7	78.3	100	
	5-8	26.0	73.9	100	

Black Female

Burn Status	Grade Group	Home Fire +	Home Fire -	Total	Percent
Scar and Burn	K-4	85	288	373	62.3
	5-8	134	466	600	69.5
No Burn	K-4	22	204	226	37.7
	5-8	35	228	263	30.5
Total	K-4	107	492	599	100
	5-8	169	694	863	100
Percent	K-4	17.9	82.1	100	
	5-8	19.6	80.4	100	

TABLE 30.--Frequencies of Scars, Burns, and No Burns by Smoke Detector for Race-Sex-Grade Groups.

White Male

Burn Status	Grade Group	Smoke Detector +	Smoke Detector -	Total	Percent
Scar	K-4	99	76	157	39.7
	5-8	63	80	143	37.2
Burn	K-4	147	119	266	60.3
	5-8	108	133	241	62.8
Total	K-4	246	195	441	100
	5-8	171	213	384	100
Percent	K-4	55.8	44.2	100	
	5-8	44.5	55.5	100	

Black Male

Burn Status	Grade Group	Smoke Detector +	Smoke Detector -	Total	Percent
Scar	K-4	48	118	166	60.4
	5-8	68	276	344	66.2
Burn	K-4	27	82	109	39.6
	5-8	29	147	176	33.8
Total	K-4	75	200	275	100
	5-8	97	423	520	100
Percent	K-4	27.3	72.7	100	
	5-8	18.7	81.3	100	

TABLE 30 - Continued

White Female

Burn Status	Grade Group	Smoke Detector +	Smoke Detector -	Total	Percent
Scar	K-4	84	60	144	35.1
	5-8	64	90	154	35.4
Burn	K-4	159	107	266	64.9
	5-8	117	164	281	64.6
Total	K-4	243	167	410	100
	5-8	181	254	435	100
Percent	K-4	59.3	40.7	100	
	5-8	41.6	58.4	100	

Black Female

Burn Status	Grade Group	Smoke Detector +	Smoke Detector -	Total	Percent
Scar	K-4	60	188	248	66.7
	5-8	93	376	469	77.9
Burn	K-4	33	91	124	22.1
	5-8	33	100	133	22.1
Total	K-4	93	279	372	100
	5-8	126	476	602	100
Percent	K-4	25.0	75.0	100	
	5-8	20.9	79.1	100	

TABLE 30 - Continued

White Male

Burn Status	Grade Group	Smoke Detector +	Smoke Detector -	Total	Percent
Scar and Burn	K-4	246	195	441	63.5
	5-8	171	213	384	81.4
No Burn	K-4	160	93	253	36.5
	5-8	43	45	88	18.6
Total	K-4	406	288	694	100
	5-8	214	258	472	100
Percent	K-4	58.5	41.5	100	
	5-8	45.3	54.7	100	

Black Male

Burn Status	Grade Group	Smoke Detector +	Smoke Detector -	Total	Percent
Scar and Burn	K-4	75	200	275	51.8
	5-8	97	423	520	64.2
No Burn	K-4	52	204	256	48.2
	5-8	61	229	290	35.8
Total	K-4	127	404	531	100
	5-8	158	652	810	100
Percent	K-4	23.9	76.1	100	
	5-8	19.5	80.5	100	

TABLE 30 - Continued

White Female

Burn Status	Grade Group	Smoke Detector +	Smoke Detector -	Total	Percent
Scar and Burn	K-4	243	167	410	64.0
	5-8	181	254	435	86.5
No Burn	K-4	117	113	230	36.0
	5-8	28	40	68	13.5
Total	K-4	360	280	640	100
	5-8	209	294	503	100
Percent	K-4	56.3	43.7	100	
	5-8	41.6	58.4	100	

Black Female

Burn Status	Grade Group	Smoke Detector +	Smoke Detector -	Total	Percent
Scar and Burn	K-4	93	279	372	61.8
	5-8	126	476	602	69.4
No Burn	K-4	47	183	230	38.2
	5-8	47	219	266	30.6
Total	K-4	140	462	602	100
	5-8	173	695	868	100
Percent	K-4	23.3	76.7	100	
	5-8	19.9	80.1	100	

TABLE 31.--Frequencies of Scars, Burns, and No Burns by Fire Escape Plan for Race-Sex-Grade Groups.

White Male

Burn Status	Grade Group	Fire Escape +	Fire Escape -	Total	Percent
Scar	K-4	90	83	173	39.5
	5-8	49	92	141	37.0
Burn	K-4	134	131	265	60.5
	5-8	72	168	240	63.0
Total	K-4	224	214	438	100
	5-8	121	260	381	100
Percent	K-4	51.1	48.9	100	
	5-8	31.8	68.2	100	

Black Male

Burn Status	Grade Group	Fire Escape +	Fire Escape -	Total	Percent
Scar	K-4	86	80	166	60.6
	5-8	116	224	340	66.3
Burn	K-4	34	74	108	39.4
	5-8	50	123	173	33.7
Total	K-4	120	154	274	100
	5-8	166	347	513	100
Percent	K-4	43.8	56.2	100	
	5-8	32.4	67.6	100	

TABLE 31 - Continued

White Female

Burn Status	Grade Group	Fire Escape +	Fire Escape -	Total	Percent
Scar	K-4	88	55	143	37.5
	5-8	54	100	154	35.6
Burn	K-4	128	136	264	65.5
	5-8	85	193	278	64.4
Total	K-4	212	191	403	100
	5-8	139	293	432	100
Percent	K-4	52.6	47.4	100	
	5-8	32.2	67.8	100	

Black Female

Burn Status	Grade Group	Fire Escape +	Fire Escape -	Total	Percent
Scar	K-4	107	138	245	66.6
	5-8	146	321	467	78.4
Burn	K-4	48	75	123	33.4
	5-8	43	86	129	21.6
Total	K-4	155	213	368	100
	5-8	189	407	596	100
Percent	K-4	42.1	57.9	100	
	5-8	31.7	68.3	100	

TABLE 31 - Continued

White Male

Burn Status	Grade Group	Fire Escape +	Fire Escape -	Total	Percent
Scar and Burn	K-4	224	214	438	64.0
	5-8	121	260	381	81.1
No Burn	K-4	127	119	246	36.0
	5-8	31	58	89	18.9
Total	K-4	351	333	634	100
	5-8	172	318	470	100
Percent	K-4	51.3	48.7	100	
	5-8	32.3	67.7	100	

Black Male

Burn Status	Grade Group	Fire Escape +	Fire Escape -	Total	Percent
Scar and Burn	K-4	120	154	274	52.3
	5-8	166	347	513	64.0
No Burn	K-4	84	166	250	47.7
	5-8	97	191	288	36.0
Total	K-4	204	320	524	100
	5-8	263	538	801	100
Percent	K-4	38.9	61.1	100	
	5-8	32.8	67.2	100	

TABLE 31 - Continued

White Female

Burn Status	Grade Group	Fire Escape +	Fire Escape -	Total	Percent
Scar and Burn	K-4	212	191	403	64.0
	5-8	139	293	432	86.4
No Burn	K-4	110	116	226	36.0
	5-8	28	40	68	13.6
Total	K-4	322	307	629	100
	5-8	167	333	500	100
Percent	K-4	51.2	48.8	100	
	5-8	33.4	66.6	100	

Black Female

Burn Status	Grade Group	Fire Escape +	Fire Escape -	Total	Percent
Scar and Burn	K-4	155	213	368	61.7
	5-8	189	407	596	69.5
No Burn	K-4	87	141	228	38.3
	5-8	74	188	262	30.5
Total	K-4	242	354	596	100
	5-8	263	595	858	100
Percent	K-4	40.6	59.4	100	
	5-8	30.7	69.3	100	

TABLE 32.--Frequencies of Place of Treatment by Four Race-Sex Groups.

Place of Treatment		Race-Sex Group					
		White Male	Black Male	White Female	Black Female	Total	Percent
Home	Frequency	687	633	728	799	2847	85.3
E.R./ Hospital	Frequency	39	66	48	80	233	7.1
Doctor's Office	Frequency	42	42	42	53	179	5.4
Other*	Frequency	32	7	28	12	79	2.4
Total		800	748	846	944	3338	100.0
Percent		24.0	22.4	25.3	28.3	100.0	

*Includes school, camping, etc.

TABLE 33.--Frequencies of Burn Cause by Place of Treatment

Burn Cause	Place of Treatment					
	Home	E.R./ Hospital	Doctor's Office	Other+	Total	Percent
HOUSEHOLD CAUSES:	1989	158	108	34	2289	73.4
Cooking	932	63	42	12	1049	32.2
Irons	549	25	18	6	598	18.4
Scalds	314	49	30	7	400	12.3
Heaters	194	21	18	9	242	7.4
Misc.*						3.1
OUTDOOR CAUSES:	467	42	37	23	569	19.6
Open Fire	307	26	24	20	377	11.6
Automobile	97	12	13	2	124	3.8
Firecracker	63	4	0	1	68	2.1
Misc.**						2.1
OTHER CAUSES:	166	17	12	11	206	7.0
Cigarettes	143	3	6	10	162	5.0
House Fire	9	11	6	1	27	.8
Abuse	14	3	0	0	17	.5
Misc.***						.7
TOTAL MISC.	145	18	20	9	192	5.9
OVERALL TOTAL	2767	235	177	77	3256	100.0
PERCENT	85.0	7.2	5.4	2.4	100.0	

*Includes electrical and hot metal burns
**Includes sunburn and gasoline spills
***Includes hot plastics
+Includes school, camping, etc.

TABLE 34.--Frequencies of Place of Treatment by Validated Scars and Burns for Two Grade Groups.

Place of Treatment	Grade Group	Self-Reported Scar R.N. Yes	Self-Reported Scar R.N. No	Self-Reported Burn R.N. Yes	Self-Reported Burn R.N. No
Home	K-4	24	84	77	34
	5-8	97	62	64	23
E.R./ Hospital	K-4	4	0	1	2
	5-8	14	1	1	3
Doctor's Office	K-4	2	0	0	2
	5-8	5	2	2	2
Other	K-4	1	0	2	1
	5-8	3	0	1	0
Do Not Know	K-4	2	1	8	4
	5-8	5	12	5	1
TOTAL	K-4	33	85	88	43
	5-8	124	80	140	29

TABLE 35.--Frequencies of Burn Cause by Validated Scars and Burns and Two Grade Groups.

Burn Cause	Grade Group	Self-Reported Scar R.N. Yes	Self-Reported Scar R.N. No	Self-Reported Burn R.N. Yes	Self-Reported Burn R.N. No
HOUSEHOLD CAUSES:	K-4	20	4	57	47
	5-8	85	19	45	27
Cooking	K-4	4	0	36	27
	5-8	22	8	29	14
Irons	K-4	8	3	8	11
	5-8	37	6	4	4
Scalds	K-4	2	0	9	6
	5-8	11	4	8	5
Heaters	K-4	6	1	4	3
	5-8	15	1	4	4
OUTDOOR CAUSES:	K-4	4	1	13	13
	5-8	20	4	13	7
Open Fire	K-4	4	0	10	9
	5-8	11	2	10	6
Automobile	K-4	0	1	2	4
	5-8	9	1	2	0
Firecracker	K-4	0	0	1	0
	5-8	0	1	1	1
OTHER CAUSES:	K-4	2	0	9	9
	5-8	3	0	4	2
Cigarettes	K-4	2	0	9	7
	5-8	2	0	3	1
House Fire	K-4	0	0	0	2
	5-8	1	0	0	0
Abuse	K-4	0	0	0	0
	5-8	0	0	1	1

TABLE 35 - Continued

Burn Cause	Grade Group	Self-Reported Scar R.N. Yes	Self-Reported Scar R.N. No	Self-Reported Burn R.N. Yes	Self-Reported Burn R.N. No
MISCELLANEOUS	K-4	1	0	4	2
	5-8	3	0	3	5
OVERALL TOTAL	K-4	27	8	83	71
	5-8	111	23	65	41

TABLE 36.--Frequencies of Place of Treatment by School and Locale.

School	Place of Treatment					
	Home	E.R./ Hospital	Doctor's Office	Other	Total	Percent
SUBURBAN:	1174	69	57	50	1350	38.1
Stiles Point	457	18	21	17	513	14.5
Wallace	436	36	19	21	512	14.4
Springfield	281	15	17	12	325	9.2
URBAN:	949	100	75	14	1138	32.1
James Simmons	306	26	20	3	355	10.0
N. Charleston	218	18	21	5	262	7.4
Rhett	226	29	6	2	263	7.4
Memminger	199	27	28	4	258	7.3
RURAL:	666	64	58	12	800	22.5
Schroeder	271	23	29	5	328	9.2
Haut Gap	227	25	20	3	275	7.8
Baxter	87	8	6	3	104	2.9
Lincoln	81	8	3	1	93	2.6
MILITARY:	224	14	13	8	259	7.3
Hunley Park	224	14	13	8	259	7.3
TOTAL	3013	247	203	84	3547	100.0
PERCENT	84.9	7.0	5.8	2.3	100.0	

TABLE 37.--Rates per 1000 School Children of Place of Treatment by School and Locale.

School	Home	E.R./ Hospital	Doctor's Office	Other	Don't Know	Denominator
SUBURBAN	804	47	39	34	75	1460
Stiles Point	818	32	38	30	82	559
Wallace	781	64	34	38	82	558
Springfield	819	44	50	35	52	343
URBAN	745	79	59	11	106	1273
James Simmons	801	68	52	8	71	382
N. Charleston	724	60	69	17	13	301
Rhett	799	102	21	7	71	283
Memminger	648	88	91	13	160	307
RURAL	725	70	63	13	129	918
Schroeder	730	62	78	13	116	311
Haut Gap	730	80	64	10	116	131
Baxter	664	61	46	23	206	105
Lincoln	771	76	28	10	114	371
MILITARY	809	51	47	28	65	277
Hunley Park	809	51	47	28	65	277

TABLE 38.--Frequencies of Correct Answers to Quiz Questions by Validated Burn Status and Two Grade Groups.

Answers	Grade Group	Scar	Burn	No Burn	Total	Percent
3 Correct	K-4	22	109	109	240	58.0
	5-8	64	66	61	191	43.1
2 Correct	K-4	24	61	60	145	35.0
	5-8	84	58	72	214	48.3
1 Correct	K-4	2	12	5	19	4.6
	5-8	8	4	10	22	5.0
Do Not Know	K-4	3	3	4	10	2.4
	5-8	9	5	2	16	3.6
TOTAL	K-4	51	185	178	414	48.3
	5-8	165	133	145	443	51.7
PERCENT	K-4	12.3	44.7	43.0	48.3	
	5-8	37.3	30.0	32.7	51.7	

TABLE 39.--Frequencies of Correct Responses to Quiz Questions by Four Race-Sex Groups.

Question Number	Race-Sex Group			
	White Male	Black Male	White Female	Black Female
One	1187	1261	1165	1364
Two	870	644	891	690
Three	1193	1272	1167	1343

TABLE 40.--Rates per 1000 Children of Correct Responses to Quiz Questions by Four Race-Sex Groups.

Question Number	White Male	Black Male	White Female	Black Female
One	957	886	965	890
Two	702	452	738	514
Three	962	893	967	876
Denominator	1240	1424	1207	1533

TABLE 41.--Frequencies of Self-Reported Burn Status by R.N. Validated Burn Status

	R. N. Report				
Self-Report	Scar	Burn	No Burn	Total	Percent
Scar	161	115	62	338	40.2
Burn	30	166	56	252	29.9
No Burn	21	31	200	252	29.9
Total	212	312	318	842	100.0
Percent	25.2	37.0	37.8	100.0	

TABLE 42.--Frequencies of Self-Reported Burn Status by R.N. Validated Burn Status and Two Grade Groups in Baxter Patrick Elementary School.

Self-Report	Grade Group	Validated Burn Status			Total	Percent
		Scar	Burn	No Burn		
Scar	K-4	7	9	0	16	40.0
	5-8	4	1	0	5	55.5
Burn	K-4	2	6	0	8	20.0
	5-8	1	1	0	2	22.2
No Burn	K-4	3	2	11	16	40.0
	5-8	0	1	1	2	22.2
Total	K-4	12	17	11	40	100
	5-8	5	3	1	9	100
Percent	K-4	30	42.5	27.5	100	
	5-8	55.5	33.3	11.1	100	

TABLE 43.--Frequencies of Self-Reported Burn Status by R.N. Validated Burn Status in Haut Gap Middle School (No K-4 Grades).

Self-Report	Grade Group	Validated Burn Status			Total	Percent
		Scar	Burn	No Burn		
Scar	5-8	21	5	1	27	35.0
Burn	5-8	7	17	4	28	36.4
No Burn	5-8	3	0	19	22	28.6
Total	5-8	31	22	24	77	100
Percent	5-8	40.2	28.6	31.2	100.0	

TABLE 44.--Frequencies of Self-Reported Burn Status by R.N. Validated Burn Status and Two Grade Groups in Hunley Park Elementary School.

Self-Report	Grade Group	Validated Burn Status			Total	Percent
		Scar	Burn	No Burn		
Scar	K-4	2	5	1	8	20.5
	5-8	0	1	0	1	25.0
Burn	K-4	1	14	5	20	51.1
	5-8	0	2	1	3	75.0
No Burn	K-4	0	1	10	11	28.2
	5-8	0	0	0	0	0
Total	K-4	3	20	16	39	100.0
	5-8	0	3	1	4	100.0
Percent	K-4	7.6	51.2	41.0	100	
	5-8	0	75.0	25.0	100	

TABLE 45.--Frequencies of Self-Reported Burn Status by Validated Burn Status in Lincoln Middle School (No Grades K-4).

Self-Report	Grade Group	Validated Burn Status			Total	Percent
		Scar	Burn	No Burn		
Scar	5-8	2	7	3	12	34.3
Burn	5-8	2	7	3	12	34.3
No Burn	5-8	0	2	9	11	31.4
Total	5-8	4	16	15	35	100
Percent	5-8	11.4	45.7	42.9	100	

TABLE 46.--Frequencies of Self-Reported Burn Status by R.N. Validated Burn Status and Two Grade Groups in Memminger Elementary School.

Self-Report	Grade Group	Validated Burn Status			Total	Percent
		Scar	Burn	No Burn		
Scar	K-4	2	17	6	25	37.8
	5-8	2	2	1	5	27.7
Burn	K-4	0	17	5	22	33.3
	5-8	0	3	3	6	33.3
No Burn	K-4	1	4	14	19	28.7
	5-8	0	0	7	7	38.8
Total	K-4	3	38	25	66	100
	5-8	2	5	11	18	100
Percent	K-4	4.5	57.5	37.9	100	
	5-8	11.1	27.8	61.1	100	

TABLE 47.--Frequencies of Self-Reported Burn Status by R.N. Validated Burn Status and Two Grade Groups in North Charleston Elementary School.

Self-Report	Grade Group	Validated Burn Status			Total	Percent
		Scar	Burn	No Burn		
Scar	K-4	10	10	2	22	43.1
	5-8	7	7	0	14	58.3
Burn	K-4	1	5	4	10	19.6
	5-8	0	9	1	10	41.6
No Burn	K-4	5	2	12	19	37.2
	5-8	0	0	0	0	0
Total	K-4	16	17	18	51	100
	5-8	7	16	1	24	100
Percent	K-4	31.3	33.3	35.3	100	
	5-8	29.2	66.6	4.2	100	

TABLE 48.--Frequencies of Self-Reported Burn Status by R.N. Validated Burn Status in Rhett Middle School (No K-4 Grades).

Self-Report	Grade Group	Validated Burn Status			Total	Percent
		Scar	Burn	No Burn		
Scar	5-8	24	1	14	39	55.7
Burn	5-8	3	2	2	7	10.0
No Burn	5-8	2	0	22	24	34.3
Total	5-8	29	3	38	70	100.0
Percent	5-8	41.4	43	543	100	

TABLE 49.--Frequencies of Self-Reported Burn Status by R.N. Validated Burn Status in Schroeder Middle School (No K-4 Grades).

Self-Report	Grade Group	Validated Burn Status			Total	Percent
		Scar	Burn	No Burn		
Scar	5-8	27	7	4	38	46.3
Burn	5-8	4	11	1	16	19.5
No Burn	5-8	5	2	21	28	34.1
Total	5-8	36	20	26	82	100.0
Percent	5-8	43.9	24.4	31.7	100.0	

TABLE 50.--Frequencies of Self-Reported Burn Status by R.N. Validated Burn Status and Two Grade Groups in James Simmons Elementary School.

Self-Report	Grade Group	Validated Burn Status			Total	Percent
		Scar	Burn	No Burn		
Scar	K-4	8	5	14	27	45.7
	5-8	8	0	5	13	65.0
Burn	K-4	2	3	8	13	22.0
	5-8	1	0	2	3	15.0
No Burn	K-4	1	0	18	19	32.2
	5-8	0	1	3	4	20.0
Total	K-4	11	8	40	59	100.0
	5-8	9	1	10	20	100.0
Percent	K-4	18.6	13.5	67.8	100.0	
	5-8	45.0	5.0	50.0	100.0	

TABLE 51.--Frequencies of Self-Reported Burn Status by R.N. Validated Burn Status and Two Grade Groups in Springfield Elementary School.

Self-Report	Grade Group	Validated Burn Status			Total	Percent
		Scar	Burn	No Burn		
Scar	K-4	2	20	2	24	29.6
	5-8	1	0	0	1	25.0
Burn	K-4	0	25	7	32	39.5
	5-8	0	0	0	0	0
No Burn	K-4	0	5	20	25	30.8
	5-8	0	2	1	3	75.0
Total	K-4	2	50	29	81	100.0
	5-8	1	2	1	4	100.0
Percent	K-4	2.4	61.7	35.8	100	
	5-8	25.0	50.0	25.0	100	

TABLE 52.--Frequencies of Self-Reported Burn Status by R.N. Validated Burn Status and Two Grade Groups in Stiles Point Elementary School.

Self-Report	Grade Group	Validated Burn Status			Total	Percent
		Scar	Burn	No Burn		
Scar	K-4	3	8	5	16	22.8
	5-8	4	2	0	6	46.1
Burn	K-4	0	20	8	28	40.0
	5-8	0	5	0	5	38.4
No Burn	K-4	0	3	23	26	37.1
	5-8	0	1	1	2	15.3
Total	K-4	3	31	36	70	100
	5-8	4	8	1	13	100
Percent	K-4	4.2	44.2	51.4	100	
	5-8	30.8	61.5	7.0	100	

TABLE 53.--Frequencies of Self-Reported Burn Status by R.N. Validated Burn Status in Wallace Middle School (No K-4 Grades).

Self-Report	Grade Group	Validated Burn Status			Total	Percent
		Scar	Burn	No Burn		
Scar	5-8	15	7	0	22	39.3
Burn	5-8	6	18	1	25	44.6
No Burn	5-8	0	4	5	9	16.1
Total	5-8	21	29	6	56	100.0
Percent	5-8	37.5	51.8	10.7	100.0	

TABLE 54.--Distribution of Rural, Suburban, and Urban School Children by Burn Status for Self-Reported Survey and Validation Study.

		Burn Status				
School Type		Scar	Burn	No Burn	Total	Percent
Urban	Self-Report	169	87	116	372	39.1
	Validated	81	90	150	321	36.9
Rural	Self-Report	120	71	87	278	29.2
	Validated	99	83	85	267	30.7
Suburban	Self-Report	75	97	70	242	25.4
	Validated	37	122	76	235	27.0
Military	Self-Report	10	33	17	60	6.3
	Validated	3	25	18	46	5.3
Total	Self-Report	374	288	290	952	100.0
	Validated	220	320	329	869	100.0
Percent	Self-Report	39.3	30.2	30.5	100.0	
	Validated	25.3	36.8	37.9	100.0	

TABLE 55.--Rates per 1000 Children of Rural, Suburban, Urban, and Military School Children by Burn Status for Validated Self-Reported Surveys and Validation Study.

School Type		Burn Status: Scar	Burn	No Burn
Urban	Self-Report	454	234	312
	Validation	252	280	467
Rural	Self-Report	432	255	313
	Validation	371	311	318
Suburban	Self-Report	310	401	289
	Validation	157	519	323
Military	Self-Repoart	167	550	283
	Validation	65	543	391
Total	Self-Report	393	303	304
	Validation	253	368	379

TABLE 56.--Frequencies of School by Self-Reported Burn Status and Two Grade Groups.

School	Grade Group	Scar	Burn	No Burn	Total	Percent
	K-4	272	393	382	1047	38.6
SUBURBAN	5-8	308	427	163	898	31.2
	K-4	159	238	257	654	24.1
Stiles Point	5-8	47	96	25	168	5.8
	K-4	0	0	0	0	0
Wallace	5-8	236	295	127	658	22.8
	K-4	113	155	125	393	14.5
Springfield	5-8	25	36	11	72	2.5
	K-4	429	283	498	1210	44.6
URBAN	5-8	346	162	233	741	25.7
	K-4	201	92	279	572	21.1
Simmons	5-8	66	13	50	129	4.5
	K-4	151	118	138	407	15.0
Memminger	5-8	25	19	33	77	2.7
	K-4	77	73	81	231	8.5
N. Charleston	5-8	53	60	23	136	4.7
	K-4	0	0	0	0	0
Rhett	5-8	202	70	127	399	13.8
	K-4	52	34	69	155	5.7
RURAL	5-8	528	262	386	1176	40.8
	K-4	0	0	0	0	0
Schroeder	5-8	252	106	212	570	19.8
	K-4	0	0	0	0	0
Haut Gap	5-8	191	111	132	434	15.1
	K-4	52	34	69	155	5.7
Baxter	5-8	20	14	8	42	1.5

TABLE 56 - Continued

School	Grade Group	Scar	Burn	No Burn	Total	Percent
Lincoln	K-4	0	0	0	0	0
	5-8	65	31	34	130	4.5
MILITARY	K-4	69	120	113	302	11.1
	5-8	20	36	111	67	2.3
Hunley Park	K-4	69	120	113	302	11.1
	5-8	20	36	111	67	2.3
TOTAL	K-4	822	830	1062	2714	48.5
	5-8	1202	887	793	2882	51.15
PERCENT	K-4	30.3	30.6	39.1		
	5-8	41.7	30.8	27.5		

TABLE 57.--Rates per 1000 Children of School by Self-Reported Burn Status and Two Grade Groups.

School	Grade Group	Scar	Burn	No Burn	Total
	K-4	331	473	360	386
SUBURBAN	5-8	256	481	206	312
	K-4	193	287	242	241
Stiles Point	5-8	39	108	32	58
	K-4	0	0	0	0
Wallace	5-8	196	333	160	228
	K-4	137	187	118	145
Springfield	5-8	20	41	14	25
	K-4	522	341	469	446
URBAN	5-8	288	183	294	257
	K-4	245	111	263	211
Simmons	5-8	55	15	63	45
	K-4	184	142	111	28
Memminger	5-8	20	21	42	27
	K-4	94	88	76	85
N. Charleston	5-8	44	68	29	47
	K-4	0	0	0	0
Rhett	5-8	168	79	160	138
	K-4	63	41	65	57
RURAL	5-8	439	295	487	408
	K-4	0	0	0	0
Schroeder	5-8	210	119	267	198
	K-4	0	0	0	0
Haut Gap	5-8	159	125	166	151
	K-4	63	41	65	57
Baxter	5-8	17	16	10	15

TABLE 57 - Continued

School	Grade Group	Scar	Burn	No Burn	Total
Lincoln	K-4	0	0	0	0
	5-8	54	35	43	45
MILITARY	K-4	84	145	106	111
	5-8	17	41	140	23
Hunley Park	K-4	84	145	106	111
	5-8	17	41	140	23
DENOMINATOR	K-4	822	830	106	2714
	5-8	1202	887	140	2882

*Don't know's excluded

TABLE 58.--Frequencies of School by Validated Burn Status for Two Grade Groups.

School	Grade Group	Scar	Burn	No Burn	Total	Percent
	K-4	5	82	67	154	37.2
SUBURBAN	5-8	31	39	8	78	17.6
	K-4	2	50	31	83	20.0
Springfield	5-8	1	2	1	4	.9
	K-4	3	32	36	71	17.2
Stiles Point	5-8	4	8	1	13	2.9
	K-4	0	0	0	0	0
Wallace	5-8	26	29	6	61	13.8
	K-4	30	64	83	177	42.8
URBAN	5-8	48	25	62	135	30.5
	K-4	11	8	40	59	14.3
Simmons	5-8	9	1	11	21	4.7
	K-4	3	39	25	67	16.2
Memminger	5-8	2	5	11	18	4.1
	K-4	16	17	18	51	12.3
N. Charleston	5-8	7	16	2	25	5.6
	K-4	0	0	0	0	0
Rhett	5-8	30	3	38	71	16.0
	K-4	13	18	11	42	10.1
RURAL	5-8	86	65	74	225	50.8
	K-4	0	0	0	0	0
Schroeder	5-8	36	21	28	85	19.2
	K-4	0	0	0	0	0
Haut Gap	5-8	32	23	24	79	17.8
	K-4	13	18	11	42	10.1
Baxter	5-8	5	4	1	10	2.3

TABLE 58.--Frequencies of School by Validated Burn Status for Two Grade Groups.

School	Grade Group	Scar	Burn	No Burn	Total	Percent
	K-4	5	82	67	154	37.2
SUBURBAN	5-8	31	39	8	78	17.6
	K-4	2	50	31	83	20.0
Springfield	5-8	1	2	1	4	.9
	K-4	3	32	36	71	17.2
Stiles Point	5-8	4	8	1	13	2.9
	K-4	0	0	0	0	0
Wallace	5-8	26	29	6	61	13.8
	K-4	30	64	83	177	42.8
URBAN	5-8	48	25	62	135	30.5
	K-4	11	8	40	59	14.3
Simmons	5-8	9	1	11	21	4.7
	K-4	3	39	25	67	16.2
Memminger	5-8	2	5	11	18	4.1
	K-4	16	17	18	51	12.3
N. Charleston	5-8	7	16	2	25	5.6
	K-4	0	0	0	0	0
Rhett	5-8	30	3	38	71	16.0
	K-4	13	18	11	42	10.1
RURAL	5-8	86	65	74	225	50.8
	K-4	0	0	0	0	0
Schroeder	5-8	36	21	28	85	19.2
	K-4	0	0	0	0	0
Haut Gap	5-8	32	23	24	79	17.8
	K-4	13	18	11	42	10.1
Baxter	5-8	5	4	1	10	2.3

TABLE 58 - Continued

School	Grade Group	Scar	Burn	No Burn	Total	Percent
MILITARY	K-4	3	21	17	41	9.9
	5-8	0	4	1	5	1.1
Hunley Park	K-4	3	21	17	41	9.1
	5-8	0	4	1	5	1.1
TOTAL	K-4	51	185	178	414	48.3
	5-8	165	133	145	443	51.7
PERCENT	K-4	12.3	44.7	43.0		
	5-8	37.3	30.0	32.7		

TABLE 59.--Rates per 1000 Children of School by Validated Burn Status for Two Grade Groups.

School	Grade Group	Scar	Burn	No Burn	Total
	K-4	98	443	38	372
SUBURBAN	5-8	188	293	55	176
	K-4	39	270	174	200
Springfield	5-8	6	15	7	9
	K-4	59	173	202	171
Stiles Point	5-8	24	60	7	29
	K-4	0	0	0	0
Wallace	5-8	158	218	41	138
	K-4	588	346	466	428
URBAN	5-8	291	188	428	305
	K-4	216	43	225	143
Simmons	5-8	55	8	76	47
	K-4	59	211	140	162
Memminger	5-8	12	38	76	41
	K-4	314	92	101	123
N. Charleston	5-8	42	120	14	56
	K-4	0	0	0	0
Rhett	5-8	182	23	213	160
	K-4	255	97	62	101
RURAL	5-8	521	489	510	508
	K-4	0	0	0	0
Schroeder	5-8	218	158	158	192
	K-4	0	0	0	0
Haut Gap	5-8	194	173	166	178
	K-4	255	97	62	101
Baxter	5-8	30	30	7	23

TABLE 59 - Continued

School	Grade Group	Scar	Burn	No Burn	Total
MILITARY	K-4	59	114	96	99
	5-8	0	30	7	11
Hunley Park	K-4	59	114	96	99
	5-8	0	30	7	11
DENOMINATOR	K-4	51	185	178	414
	5-8	165	133	145	443

*Don't knows excluded

TABLE 60.--Rates per 1000 Children of Self-Reported Burns, Regardless of Severity, by Cause and School.

	School										
	SUBURBAN			URBAN				RURAL			MIL
	Sti	Wal	Spr	Sim	Mem	NCh	Rhe	Sch	Hau	Bax	Lin	Hun
HOUSEHOLD CAUSES	585	612	555	768	698	591	801	575	556	500	634	641
Cooking	374	365	328	245	221	284	230	162	239	269	230	402
Iron	75	112	83	344	262	105	365	157	139	123	76	83
Scalds	112	109	118	65	131	133	106	124	77	62	125	141
Heaters	23	26	26	104	84	69	99	132	100	46	201	14
OUTDOOR CAUSES	176	215	212	73	87	153	64	189	187	138	163	152
Open Fire	118	121	149	60	69	108	42	129	120	107	96	108
Automobile	28	64	37	0	3	29	11	51	61	23	29	28
Firecracker	30	30	25	13	15	16	11	8	6	8	38	14
OTHER CAUSES	66	32	75	68	96	82	21	5	36	61	67	105
Cigarettes	61	30	63	34	77	62	17	0	23	38	28	98
House Fire	4	0	9	13	19	13	4	25	6	15	19	7
Abuse	1	2	3	21	0	7	0	25	6	8	19	0
MISC. CAUSES*	91	59	77	42	44	49	14	21	36	56	58	65
Do Not Know	82	82	80	59	75	124	99	208	184	246	77	36
Denominator	561	562	348	384	321	306	282	370	309	130	104	276

*Includes electrical and hot metal burns, sunburn, gasoline spills, and hot plastics.

TABLE 61.--Frequencies of Self-Reported Burns, Regardless of Severity, by Cause for Suburban, Urban, Rural, and Military Schools.

Burn Cause	School Type				Total	Percent
	Suburban	Urban	Rural	Military		
HOUSEHOLD CAUSES	865	922	516	177	2480	71.1
Cooking	529	317	193	111	1150	33.5
Irons	134	351	125	23	633	17.9
Scalds	165	138	91	39	433	12.5
Heaters	37	116	107	4	264	7.2
Misc.*						3.1
OUTDOOR CAUSES	294	123	163	42	620	17.9
Open Fire	186	90	109	30	415	11.7
Automobile	65	13	44	8	130	3.7
Firecracker	43	18	10	4	75	2.1
Misc.**						2.1
OTHER CAUSES	81	88	28	29	226	6.3
Cigarettes	73	62	15	27	177	5.0
House Fire	5	16	7	2	30	.8
Abuse	3	10	6	0	19	.5
Misc.***						.7

TABLE 61 - Continued

Burn Cause	Suburban	Urban	Rural	Military	Total	Percent
TOTAL MISC.	111	49	32	18	210	5.9
OVERALL TOTAL	1351	1180	739	266	3536	100.0
PERCENT	38.2	33.4	20.9	7.5	100.0	

*Includes electrical and hot metal burns
**Includes sunburn and gasoline spills
***Includes hot plastics.

TABLE 62.--Rates per 1000 Children of Self-Reported Burns, Regardless of Severity, by Cause for Suburban, Urban, Rural, and Military Schools.

Burn Causes	Suburban	Urban	Rural	Military	Total
HOUSEHOLD CAUSES	588	713	565	641	627
Cooking	359	245	211	402	291
Irons	91	271	137	83	160
Scalds	112	107	99	141	109
Heaters	25	90	117	14	67
OUTDOOR CAUSES	199	95	179	152	157
Open Fire	126	70	119	108	105
Automobile	44	10	48	28	33
Firecracker	29	14	11	14	18
OTHER CAUSES	55	68	31	105	57
Cigarettes	50	48	16	98	44
House Fire	3	12	8	7	7
Abuse	2	8	7	0	5
MISC. CAUSES*	75	37	35	65	53
Do Not Know	82	87	190	36	105
DENOMINATOR	1471	1293	913	276	3953

*Includes electrical and hot metal burns, sunburn, gasoline spills and hot plastics.

TABLE 63.--Frequencies of Scars and Burns by Body Area Burned for Validation Study.

Body Area Burned	Burn Status				
	Scar	Burn	Total	Percent	Percent
UPPER EXTREMITY:	130	241	371	71.1	68.9
Arm	82	101	183	35.1	34.0
Hand and finger	48	140	188	36.0	34.9
LOWER EXTREMITY:	66	31	97	18.5	18.0
Leg and thigh	61	18	79	15.1	14.7
Feet and toe	5	13	18	3.4	3.3
TRUNK:	16	16	32	6.1	5.9
Chest and side	7	5	12	2.3	2.2
Abdomen	8	5	13	2.5	2.4
Back and buttock	1	6	7	1.3	1.3
OTHER:	8	14	22	4.2	4.1
Head, face and neck	8	12	20	3.8	3.7
Multiple areas	0	2	2	.4	.4
TOTAL KNOWN	220	302	522	100.0	
Do Not Know	0	17	17		3.2
TOTAL	220	319	539		100.0
PERCENT	40.8	59.2	100.0		

TABLE 64.--Characteristics of Total School Population.

	PERCENT
Males	51.43
Black	26.71
White	24.13
Females	48.57
Black	25.75
White	22.32
Other	1.09

TABLE 65.--Distribution of Students Who Are Not Black or Caucasian.

	Sex	Percent
Espanic	Male	0.17
	Female	0.13
Asian	Male	0.38
	Female	0.35
Alaskan or Indian	Male	0.04
	Female	0.02

TABLE 66.--Frequencies of Grades K-8 and Special Education by Self-Reported Burn Status.

	Self-Report Burn Status				
Grade	Scar	Burn	No Burn	Total	Percent
K	41	76	120	237	4.17
1	141	199	273	613	10.8
2	186	150	241	577	10.2
3	218	199	233	650	11.5
4	236	206	194	636	11.2
5	225	227	151	603	10.6
6	289	221	185	692	12.3
7	325	193	214	732	12.9
8	363	246	243	853	15.0
S	20	27	28	75	1.3
TOTAL	2044	1744	1882	5670	100.0
PERCENT	36.0	30.8	33.9	100	

TABLE 67.--Rates per 1000 of Grades K-8 and Special Education by Self-Reported Burn Status.

Grade	Scar	Burn	No Burn	Total
K	7	13	21	41
1	25	35	48	108
2	33	26	43	102
3	38	35	41	114
4	42	36	34	112
5	40	40	27	106
6	51	39	33	123
7	57	34	38	129
8	64	43	43	150
S	4	5	4	13
TOTAL	360	307	332	

TABLE 68.--List of Specific Causes in Rank Order

Burn Cause	Absolute Frequency	Percent Frequency
Irons	558	14.1
Kitchen Stove	509	12.9
Other*	459	11.6
Do Not Know	412	10.4
Pots and Pans	337	8.5
Hot Water	298	7.5
Heater	250	6.3
Grease	223	5.6
Cigarette	126	3.2
Matches	124	3.1
Motor Bike	84	2.1
Curling Irons	73	1.8
Firecracker	64	1.6
Coffee	42	1.1
Lighter	41	1.0
Fireplace	35	.9
Campfire	33	.8
Wood Heater	32	.8
House Fire	31	.8
Grill	27	.7
Candle	27	.7
Ashes	23	.6
Tea	22	.6
Car Pipe	21	.5
Electric Stove	16	.4
Light Bulb	15	.4
Lawnmower	14	.4
Sparklers	13	.3
Soup	12	.3
Lamp	9	.2

TABLE 68 - Continued

Burn Cause	Absolute Frequency	Percent Frequency
Hot Curlers	9	.2
Cooking Utensils	9	.2
Hot Pot	6	.2
Steam	5	.1
Gasoline Heater	1	.1
TOTAL	3960	

TABLE 69.--Frequencies of Specific Burn Causes by Eight Groups (Race-Sex-Grade) and Two Grade Groups.

Specific Cause	White Male		Black Male		White Female		Black Female	
	K-4	5-8	K-4	5-8	K-4	5-8	K-4	5-8
Irons	21	12	67	84	26	33	120	161
Kitchen Stove	81	64	40	35	95	77	39	31
Other*	64	80	23	55	59	62	31	53
Do Not Know	47	28	35	99	18	19	39	52
Pots and Pans	40	43	18	36	63	62	21	29
Hot Water	30	28	15	43	39	33	29	57
Heater	15	13	29	58	12	12	29	72
Grease	15	18	15	38	13	46	14	54
Cigarette	28	7	9	3	27	13	18	6
Matches	24	14	13	16	12	8	9	12
Motor Bike	7	28	0	11	7	10	0	9
Curling Irons	0	1	2	5	4	9	17	32
Firecrackers	13	14	5	12	2	7	1	4
Coffee	8	3	1	2	8	13	1	5
Lighter	6	10	6	4	4	4	2	5
Fireplace	12	6	3	0	3	3	2	4
Campfire	4	11	0	5	2	6	1	3
Wood Heater	0	1	2	8	1	1	3	15
House Fire	5	0	2	6	3	1	5	4
Grill	9	5	1	1	3	6	0	1
Candle	9	2	0	2	5	3	1	2
Ashes	6	2	2	3	3	2	0	3
Tea	1	1	1	7	6	0	1	5
Car Pipe	1	2	0	4	3	6	1	1
Electric Stove	3	1	1	0	2	2	3	2
Light Bulb	4	1	1	2	2	0	1	2
Lawnmower	4	5	1	1	0	3	0	0

TABLE 69 - Continued

Specific Cause	White Male		Black Male		White Female		Black Female	
	K-4	5-8	K-4	5-8	K-4	5-8	K-4	5-8
Sparklers	2	1	2	3	1	3	1	0
Soup	2	4	0	0	2	0	0	4
Lamp	2	1	1	2	0	2	1	0
Hot Curlers	0	0	0	0	2	3	3	1
Cooking Utensils	0	1	0	0	1	6	0	1
Hot Pot	0	0	1	0	1	1	3	0
Steam	1	0	0	0	1	0	0	2
Gasoline Heater	0	0	0	1	0	0	0	0
TOTAL	464	407	296	546	430	456	396	632

TABLE 70.--Frequencies of Self-Reported Cause Group by Validated Cause Group and Two Grade Groups.

Self-Reported Cause Group	Validated Cause Group																							
	Household Causes								Outdoor Causes						Other						Misc.		Do Not Know		Total	
	Cook		Iron		Scald		Heat.		Open		Auto		Firecr		Cig.		House F.		Abuse							
	K-4	5-8	K-4	5-8	K-4	5-8	K-4	5-8	K-4	5-8	K-4	5-8	K-4	5-8	K-4	5-8	K-4	5-8	K-4	5-8	K-4	5-8	K-4	5-8	K-4	5-8
HOUSEHOLD CAUSES	63	64	23	53	13	25	13	23	4	3	1	2	2	0	3	3	0	1	0	0	2	4	3	0	127	178
Cooking	55	53	1	6	2	5	1	1	2	1	1	2	2	0	1	3	0	1	0	0	1	1	1	0	67	73
Irons	4	6	22	44	0	1	1	0	1	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	30	47
Scalds	4	4	0	2	11	19	0	1	1	2	0	0	0	0	0	0	0	0	0	0	0	1	1	0	17	29
Heaters	0	1	0	1	0	0	11	21	0	0	0	0	0	0	1	0	0	0	0	0	0	1	1	0	13	24
OUTDOOR CAUSES	3	1	1	3	0	2	2	1	14	21	6	11	2	1	3	0	0	0	0	0	0	2	0	1	31	45
Open Fires	3	2	1	3	0	2	2	0	13	20	0	1	1	0	3	0	0	0	0	0	0	1	0	0	23	29
Automobile	0	0	0	0	0	0	0	1	1	0	6	10	0	0	0	0	0	0	0	0	0	0	0	1	7	12
Firecracker	0	1	0	0	0	0	0	0	0	1	0	0	1	1	0	0	0	0	0	0	0	1	0	0	1	4
OTHER CAUSES	2	0	0	1	0	0	0	0	0	0	0	0	0	0	17	5	0	1	0	2	1	0	0	0	20	9
Cigarettes	2	0	0	1	0	0	0	0	0	0	0	0	0	0	16	5	0	0	0	0	0	0	0	0	18	6
House Fire	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	1	0	0	0	2	1
Abuse	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	2
MISC. CAUSES	4	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	9	1	0	7	10
TOTAL OVERALL	72	70	24	57	13	27	15	24	19	24	7	13	4	1	23	8	0	2	0	2	4	15	4	1		
DO NOT KNOW	9	11	5	5	3	2	0	2	3	8	1	0	0	2	1	0	0	0	0	0	2	1	0	1		

APPENDIX E

CHARLESTON BURN SURVEY

CONCLUSIONS

1. Sixty-five percent of children in grades K-8 report burns. Thirty-five percent of these burns resulted in a scar.

   K-4: 59.5% burned; 29.6% scarred
   5-8: 70.8% burned; 40.6% scarred

2. Whites report more burns than blacks, but blacks report scars more often, especially black females.

3. Out of a total of 3,279 burns, 2,319 are caused by accidents in the home. This is a target area for education.

4. Black females, grades 5-8 are burned by more household causes than any other race-sex-grade group. This most likely reveals the housekeeping responsibilities of these children. This is another target for education.

5. White males playing outside around open fires, automobiles, and motorcycles are burned more than any other race-sex-grade group. This is another educational target group. Children in grades K-4 receive more abuse from other siblings and run into cigarettes held in a smoker's hand.

6. Most children report no smoke detector or fire escape plan in their home. Blacks do not have smoke detectors or fire escape plans in their homes as often as whites.

Smoke Detector	Fire Escape Plan
63.6% blacks report NO	64.9% blacks report NO
56.2% whites report NO	56.2% whites report NO

7. Home fires are not uncommon in the children's home. More whites report home fires than blacks; 25.8%/20.6%.

8. The home is the most common place for treating burns. Most burns involve the hand and arm. All burns, however, have a life-threatening potential.

Stanley H. Schuman, M. D.
Charlyne Littlefield
Ken Buhmeyer

September, 1980

1980 CHARLESTON BURN SURVEY - GRADES K-8

DATA BY GRADES:

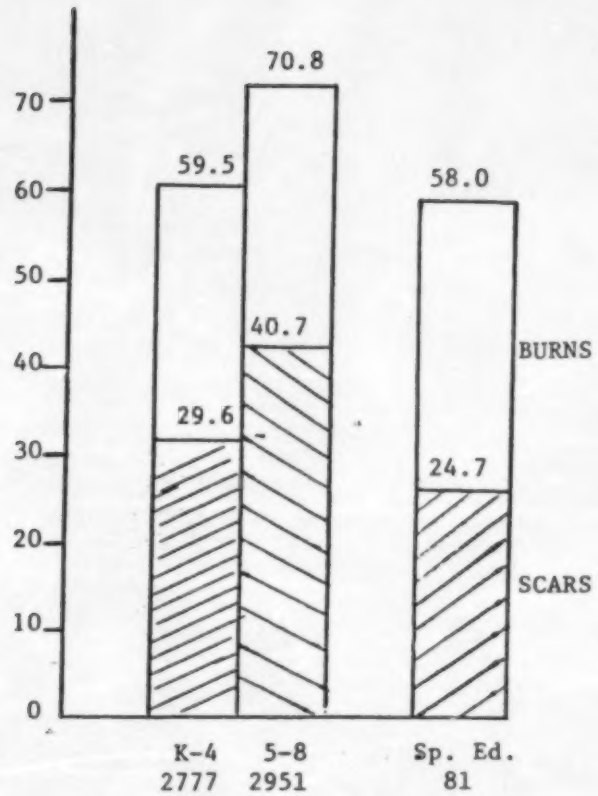
	a	b	d	3	d/b	e/b	e/d
K-4	-	2777	1652	822	59.5	29.6	49.8
5-8	-	2951	2089	1202	70.8	40.7	57.5
Sp. Ed.	-	81	47	20	58.0	24.7	42.6
TOTALS	6736	5809	3788	2044	65.2	35.2	54.0

DATA BY SEX/RACE

	a	b	d	e	d/b	e/b	e/d
Black Male	-	1405	814	519	57.6	36.9	63.7
White Male	-	1213	833	319	68.7	26.3	38.3
All Males	-	(2618)	(1647)	(838)	(62.9)	(32.0)	(50.9)
Black Females	-	1523	989	730	64.9	47.9	73.8
White Females	-	1182	858	303	72.6	25.6	35.3
All Females	-	(2705)	(1847)	(1033)	(68.3)	(38.2)	(55.9)
TOTALS	6736	5323	3494	1871	65.6	35.1	53.5

KEY		ALL SCHOOLS
a	Number at risk in survey	6736
	Number of questionnaires completed	5825
	Percent response	86.5
	Number unsatisfactory	154
b	Number satisfactory	5671
c	No burn reported	1883
d	Burns (and scars)	3788
e	Scars	2044
e/d	Severity of burn	54.0

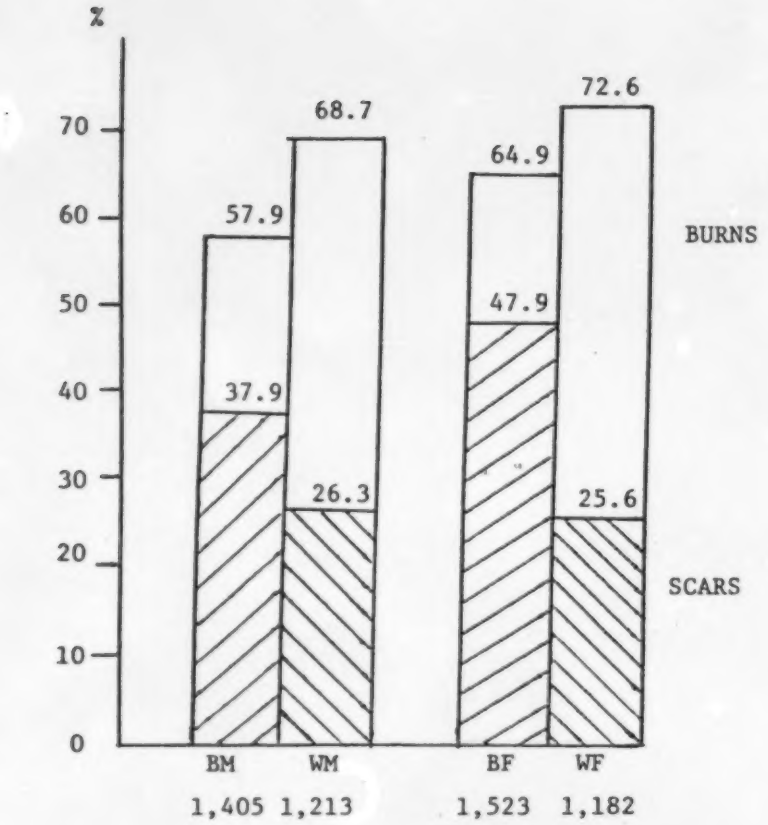
BURN AND SCAR RATE PER 100 CHILDREN BY GRADE



The average burn rate per 100 school children is 65.2.

N = 5,809

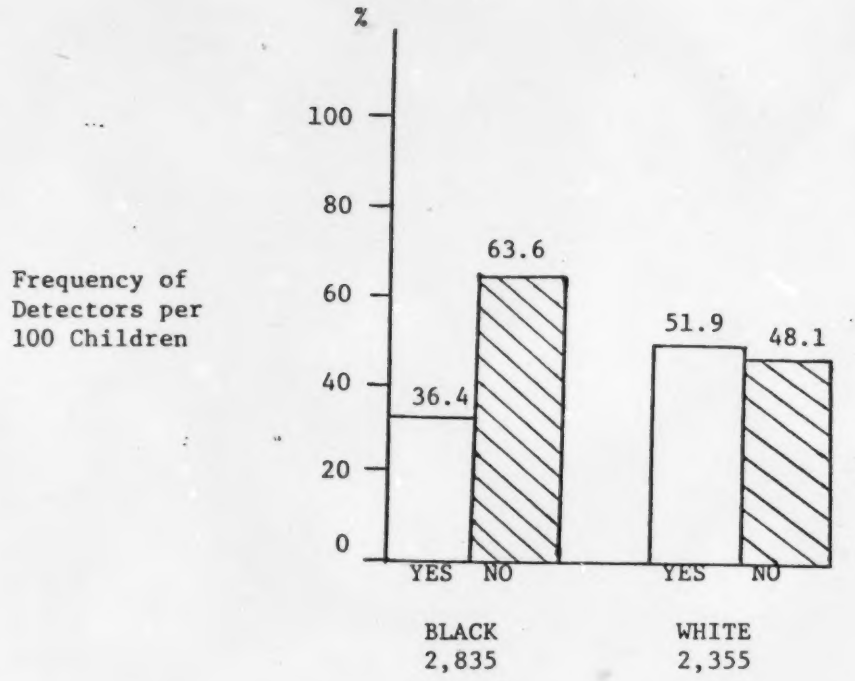
BURN AND SCAR RATE PER 100 CHILDREN BY SEX



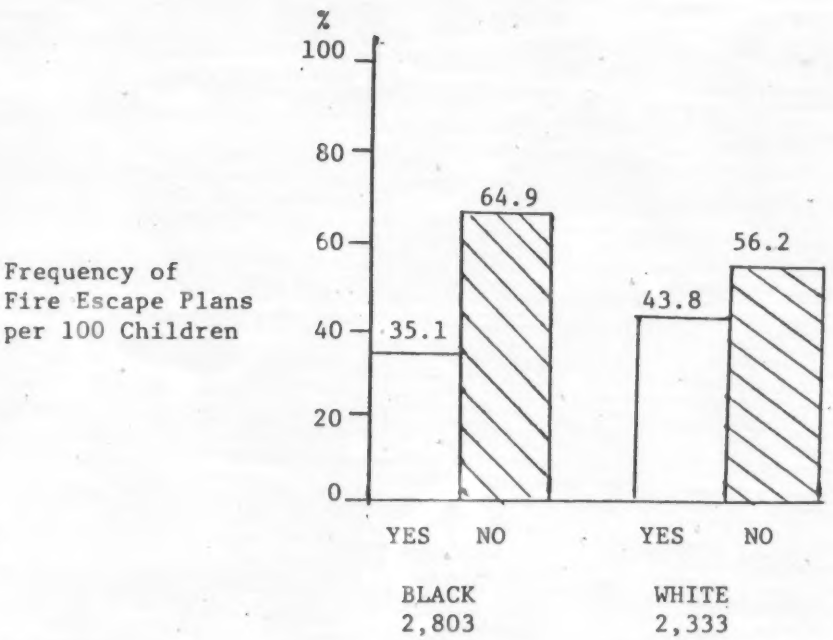
N = 5,323

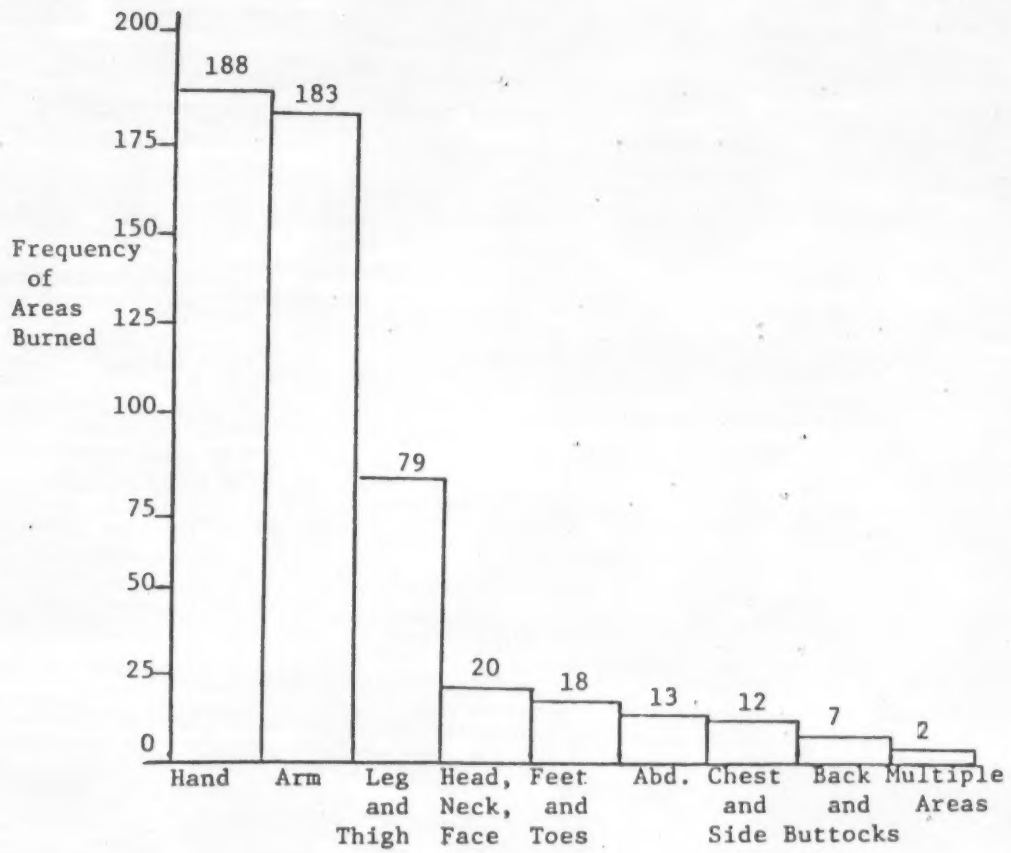
BM = Black Male
WM = White Male
BF = Black Female
WF = White Female

DO YOU HAVE A SMOKE DETECTOR IN YOUR HOME?



DO YOU HAVE A FIRE ESCAPE PLAN FOR YOUR HOME?




200
175
150
125
100
75
50
25
0
Frequency of Areas Burned
188
183
79
20
18
13
12
7
2
Hand
Arm
Leg and Thigh
Head, Neck, Face
Feet and Toes
Abd.
Chest and Side
Back and Buttocks
Multiple Areas

SCAR AND BURN RATES BY GRADE